VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a major, industrial permit. This permit action will reclassify the facility from a major facility to a minor facility. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260 et seq. The discharge results from treated wastewater and non-contact cooling water from a menhaden fish processing plant. This permit action consists of updating special conditions, re-evaluating monitoring and toxicity testing, establishing limitations in accordance with TMDL wasteload allocations, and updating the permit to reflect process changes at the facility. SIC Code: 2077

1. **Facility Name:** Omega Protein, Inc.- Reedville
   Mailing Address: P.O. Box 175
   Reedville, VA 22539

   Location: 610 Menhaden Road
   Reedville, VA 22539
   Northumberland County

2. **Permit Number:** VA0003867
   Existing Permit Expiration Date: December 1, 2010

3. **Owner Contact Name:** Mr. William E. Purcell
   Title: Environmental Manager
   Permit Owner: Omega Protein, Inc.
   Telephone No: 804-453-4211

4. **Application Complete Date:** March 9, 2011
   Permit Drafted By: Jaime Bauer, Piedmont Regional Office
   Reviewed By: Drew Hammond — Date: February 22, 2011
   Reviewed By: Ray Jenkins — Date: February 24, 2011
   Reviewed By: Curt Linderman — Date: February 18, 2011
   Public Notice Dates: First Publication Date: March 30, 2011 — Second Publication Date: April 6, 2011
   Public Comment Period: From: March 30, 2011 — To: April 29, 2011
   Newspaper: Northumberland Echo

5. **Receiving Stream Name:** Cockrell Creek (Outfall 995)
   Unnamed Tributary to Cockrell Creek (Outfall 002)
   Basin: Chesapeake Bay, Atlantic Ocean, and Small Coastal Basins
   Sub-basin: N/A
   Section: 2
   Class: II
   Special Standards: a
   River Mile: Outfall 002: 7-XAN000.14 — Outfall 995: 7-COC001.0
   7-Day, 10-Year Low Flows: N/A: Saltwater
   Tidal? Yes
   On 303(d) List? Yes

   See Flow Frequency Memo dated January 28, 2011 (**Attachment 1**)

6. **Operator License Requirements** (9 VAC 25-790-300): Class III

7. **Reliability Class** (9 VAC 25-790-70): Not Applicable – No authorized sewage discharge.

8. **Permit Characterization:**
☒ Private ☐ Federal ☐ State ☐ POTW
☐ Possible Interstate Effect ☐ Interim Limits in Other Document (attach to FS)

9. **Discharge Description**

Outfall Number	Discharge Source	Treatment	Daily Flow*
002	Evaporator and Dryer Condensate, Boiler Blowdown (*Includes 1-4 gpm wastewater from the fish oil processing facility*)	Ammonia Stripping	0.178 MGD long term average 0.265 MGD maximum 30 day value 0.320 MGD maximum daily value
995	Non-contact Cooling Water	None	2.377 MGD long term average 3.188 MGD maximum 30 day value 4.212 MGD maximum daily value
-	Refrigeration Water (from Fishing Vessels)	None	Unknown; Subject to criteria that the discharge be made while the ships are underway at a rate such that the discharge is minimized.

*Flows as reported on Form 2C received on January 11, 2011.

See **Attachment 2** for facility operations diagram and water usage.

Omega Protein, formerly Zapata Protein, Inc., processes menhaden by cooking the fish, pressing and separating the oil and solids, and evaporating the water to leave fish meal and oil. The typical fishing season lasts for about 200 days, beginning in May and ceasing approximately the first week of December. Omega currently owns and operates ten fishing vessels capable of carrying 1.2 to 2.2 million fish each. While at sea, the fishing vessels take on seawater that is chilled and used for refrigeration of the catch to keep fish cold in the ship holds until they are offloaded at the dock. Refrigeration water is defined as seawater taken on by the fishing vessel that is run through the vessel's chillers to lower the water temperature to approximately 36°F. The water is circulated between the fish holds where the catch is stored and the chillers to maintain the fish as fresh as possible for processing. Prior to offloading the catch, most of the refrigeration water is disposed east of a line between Great Wicomico River Light (formerly known as Fleeton Point Light) and Green Can Buoy No. 3. Discharge of refrigeration water shall be conducted in such a manner that the discharge plume is minimized. A small residual of refrigeration water is retained within the mass of fish. Section 9 VAC 260-20 B.2 of the Virginia Water Quality Standards states that mixing zones in open ocean, estuarine, and transition zone waters shall not "prevent or cause lethality to passing and drifting aquatic organisms through the water body in questions; and extend more than five times in any direction the average depth along a line extending 1/3 of the way across the receiving water from the discharge to the opposite shore." The plume associated with the discharge of refrigeration water has not historically nor is expected to cause lethality in passing aquatic organisms. Additionally, since the Chesapeake Bay has an average depth of approximately 21 feet, the plume created from the discharge of refrigeration water shall be dissipated no more than 105 feet in any direction.

Once at the dock, the ships offload the catch by hydraulic transfer. Residual refrigeration water in the fish holds, fresh creek water used to prime the fish pumps, and any liquids given up by the fish during the transfer process is considered bail water. Bail water is stored in above ground tanks on site until disposal; however, some residual bail water is processed through the plant with the catch and discharged at Outfall 002. The bail water stored on site is barged to the Atlantic Ocean for disposal. The discharge of fish waste is allowed in international waters under The Marine Protection, Research, and Sanctuaries Act (Title 33 Chapter 27 Subpart I Section 1412(d)). The discharge of bail water to state waters other than via Outfall 002 and in accordance with Part I.A.1 of the permit is not authorized by this permit. Prior to the 2012 fishing season, the permittee intends to install a waste heat evaporator system for handling of all bail water. This type of evaporator is used at other facilities owned by the permittee. The evaporator produces two condensate streams: clean condensate and dirty condensate. The dirty condensate stream is condensate from the Dupps Dryers that is providing the waste heat for the evaporative process. This

dirty condensate is currently treated in the treatment train so there is no expected increase in load to the treatment train. The clean condensate will be used as boiler feed water.

As fish are processed, wastewater from the fish cooker, identified as stickwater, is pressed and centrifuged to a consistency of 10% solids. The stickwater is further evaporated to a condensate consisting of approximately 50 percent solids. This includes wastewater generated from the fish oil processing facility at the plant. Currently, condensate is treated through ammonia strippers, two aerated ponds, and is sent to a dissolved air floatation (DAF) unit and a UV disinfection unit. Wastewater exiting the disinfection unit is then discharged from Outfall 002 into an unnamed tributary of Cockrell Creek. A portion of the treated water is reused within the plant as cooling water, vacuum pump seal water, and for plant wash down. Reuse of some of the treated water has resulted in a decrease in flows from Outfall 002.

With this permit reissuance, the permittee is proposing to remove the aerated ponds, DAF, and disinfection units from the treatment train, under normal operations. Wastewater leaving the ammonia stripper will be piped directly to Outfall 002, which will remain in the same location. Data submitted by the permittee suggests that ammonia concentrations discharging from the aerated ponds are higher than concentrations entering the ponds from the ammonia strippers, especially during the colder operation months when nitrification is minimal or ceases. Disinfection treatment was required due to the presence of bacteria found in the effluent at Outfall 002. The permittee contends that the presence of bacteria at Outfall 002 is due to wildlife that uses the aerated ponds. The wastewater leaving the ammonia strippers will be fully contained upon leaving the ammonia strippers within piping until discharging at Outfall 002. If wastewater is no longer directed to the ponds, then disinfection is anticipated to no longer be necessary. The DAF was installed for solids separation to maximize the efficiency of UV disinfection. Since disinfection is no longer believed necessary, then the DAF unit will also become unnecessary. The proposed changes of the Outfall 002 treatment train and re-piping are not considered an upgrade under the Regulation for Nutrient Enriched Waters and Discharges within the Chesapeake Bay Watershed (9 VAC 25-40 et.seq.) 9 VAC 25-40-70 states that technology based effluent concentration limitations are to be added to the individual permit for any facility that has "installed technology for the control of nitrogen and phosphorus whether by new construction, expansion, or upgrade." While the proposed changes at Outfall 002 are expected to improve the water quality of the process wastewater by decreasing ammonia concentrations, the permittee is not proposing any activities of new construction, expansion, or upgrading.

The permittee is requesting that the ponds be allowed to stay in place to be used in the case of an emergency for storage. In an emergency situation, process wastewater would be stored in the ponds. Upon resuming plant operations, any wastewater stored in the ponds would flow to the DAF to remove algae and then flow to the ammonia strippers and then flow to the UV unit for disinfection of bacteria introduced from wildlife while water was in storage. Closure of the aerated ponds, DAF, and disinfection units as normal modes of treatment will be subject to the DEQ review and approval in accordance with Part I.B.12 of the permit. The Outfall 002 effluent limitations will be effective for all discharges under normal and emergency operations.

Also discharged from Outfall 002 is a small amount of boiler blowdown created from the operation of cookers and steam dryers.

Outfall 995 is the combined discharge of non-contact cooling water used by the evaporators in the processing of fish condensate. This outfall is the combination of discharges from outfalls previously designated 004 and 005.

Also of note, the boat engines require the continuous cycling of external cooling water and a discharge of this cooling water may be seen at the dock if the engines are running while the vessels wait to unload the catch.

Removed with this permit reissuance is the authorization of discharge from Outfalls 001 and 003. In previous years, the permittee discharged contact cooling water at Outfall 001 generated from the operation of scrubbers used for air pollution control. At the end of the 2009 fishing season, the wet scrubbing system was removed; airless dryers, which do not generate wastewater, were installed for the process. Previous permits authorized the discharge of evaporation condensate, on an emergency basis, into a quadrant of

the Chesapeake Bay designated as Outfall 003. This method of disposal has not been used in over 20 years is no longer necessary for the operations of the facility.

10. **Sludge Use or Disposal**: Not Applicable

11. **Discharge Location Description**: This facility discharges to Cockrell Creek and an unnamed tributary to Cockrell Creek, both of which are tributaries of the Chesapeake Bay.
Name of USGS topo map: 145D Reedville (See **Attachment 3**)

12. **Material Storage**: Several chemicals are stored on-site but have limited potential of coming in contact with surface waters. These chemicals include:

- Marine Paints for touch up work on the menhaden fishing vessels. Brushwork only, no spraying, is done at this facility.
- There are 9 active Above Ground Storage Tanks on the site that contain petroleum ranging in capacity from 1,000 gallons to 508,000 gallons. The tanks are located inside bermed areas in case of leaks. The facility is subject to the Oil Discharge Contingency Plans (ODCP) under the petroleum regulations because the total capacity of the storage tanks is greater than 25,000 gallons. Tanks storing fish oil are not regulated under the petroleum program but are also stored within bermed areas to contain any product in case of leaks. A description of those tanks storing fish oil are as follows:

Tank No.	Description	Gallons
01	Fish Oil Production	15,645
02	Fish Oil Production	24,000
03	Fish Oil Production	24,000
04	Fish Oil Production	20,000
05	Fish Oil	132,193
06	Fish Oil	58,752
07	Fish Oil	508,144
08	Fish Oil	308,378
09	Fish Oil	293,760
10	Fish Oil	93,861
24	Fish Oil	308,378
27	Fish Oil	508,144
47	Fish Oil	308,378
76	Fish Oil	508,144
F11	Fish Oil	17,626
F12	Fish Oil	23,500

13. **Ambient Water Quality Information**:
The Cockrell Creek water body encompasses the area southeast and east of Lilian on Rte. 360 to the confluence with Ingram Bay and Chesapeake Bay, including Cockrell Creek and numerous unnamed coves. This water body is classified as water quality limited. The DEQ maintains a water quality monitoring station located on Cockrell Creek approximately 0.6 miles upstream of the facility at the end of Main Street in Reedville (7-COC001.61). Sampling data for this station may be seen in **Attachment 4**. Water Quality Assessments indicate that the segments of Cockrell Creek to which the facility discharges is impaired for submerged aquatic vegetation and bacteria. Additionally, the Virginia Department of Health has issued a Fish Consumption Advisory (for PCBs) and Shellfish Condemnation for the segments. See item 26 of this fact sheet for additional information regarding Water Quality Assessments, Designated Uses, and TMDL applicability.

14. **Antidegradation Review & Comments: Tier 1** ☒ **Tier 2** ☐ **Tier 3** ☐
The State Water Control Board's Water Quality Standards include an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social

impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters. The limitations in this permit were developed in accordance with Section 303(d)(4) of the Clean Water Act. Therefore, antidegradation restrictions do not apply.

Cockrell Creek is a tier 1 stream, considered fully allocated, based on the 1976 VIMS model (**Attachment 5**) and supporting documentation. The model was performed to model the creek for the menhaden plant limitations and showed a wasteload allocation of 5000 lb/day BOD_5. This wasteload allocation was split between the two menhaden plants on the creek at the time, and an amount (100 lb/day) was delegated to the Reedville WWTP, located upstream of the Omega facility. Additionally, Cockrell Creek is considered a tier 1 stream because it is on the 303(d) list for impaired waters. See item 26 of this fact sheet for additional information on impairments.

15. **Site Inspection: Date:** November 5, 2009 Performed by M. Dare (See **Attachment 6**)

16. **Effluent Screening & Limitation Development**

The reasonable potential analysis is performed by calculating the parameter wasteload allocations based on ambient water quality data for the receiving stream, mixing characteristics between the receiving stream and effluent, and effluent characteristics. This information is entered into the agency established MSTRANTI WLA Spreadsheet to calculate acute, chronic, and human health wasteload allocations. The WLAs are entered into the STATS.exe statistical software application along with effluent monitoring data collected by the permittee as required by the permit application or previous permit to determine the need for permit limitations and, if necessary, calculate the limitations that are protective of water quality.

As part of the reissuance permit application, the permittee was required to perform water quality criteria monitoring to collect data for use in establishing water quality based permit limitations. The permittee provided data on only a limited number of parameters. Due to the seasonal nature of the facility operations, the remaining sampling could not be performed in time to be used for the permit reissuance. As a condition of this permit reissuance, the permittee will be required to perform complete water quality criteria monitoring and if the results demonstrate the potential for the discharges from this facility to impact water quality, the permit will be reopened and modified to establish the proper limitations to ensure water quality is protected. Additionally, complete water quality criteria monitoring of Outfall 002 will provide an accurate characterization of the effluent following the proposed operational changes of evaporator condensate treatment.

That data that was submitted with the application along with monitoring reports submitted to the agency during the term of the 2005 permit were used to evaluate for reasonable potential of the facility to impact water quality at the receiving stream. Documentation of the reasonable potential analysis and permit limitation development for Outfall 002 is included in **Attachment 7**. The reasonable potential analysis and supporting documentation for Outfall 995 is available in **Attachment 8.** For the analysis, receiving stream data was obtained based on ambient water quality data collected from station 7-COC001.61 (**Attachment 4**) by the DEQ from 1993 to 2010 and is believed to represent the current ambient water quality of Cockrell Creek.

Outfall 002

BOD_5, TSS, Oil & Grease
The EPA promulgated Effluent Limitations Guidelines for Fish Meal Processing (40 CFR Part 408.150 – Subpart O). Agency staff used the guideline to calculate permit limits based on technology and compare those suggested limits to water quality based calculated limitations. See **Attachment 7** for the proposed federal regulation 40 CFR 408.150 and evaluation of limitations.

Ammonia
The reasonable potential analysis included in **Attachment 7** indicates the need for an ammonia limitation on the discharge of wastewater from Outfall 002 of 32.6 mg/L (average) and 40.2 mg/L (maximum).

Total Phosphorous
The limitation of 2.0 mg/L Total Phosphorous is applied based on Nutrient Enriched Waters regulations and policy. The facility was previous applicable to the NEW-20 standard of the Virginia Water Quality Standards which has since been repealed and replaced with the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed. In accordance with the anti-backsliding policy and GM07-2008, the limitations are being carried forward with this permit action. The weekly loading limitation is calculated based on a maximum 30 day flow of 0.265 MGD [2.0 mg/L * 0.265 MGD * 8.34 = (4.4202 lb/d)/2.2 = 2.0 kg/d].

DEQ Toxics Management Policy
See **Attachment 9** for Whole Effluent Toxicity data analysis and limitation calculation.

Outfall 995:

Copper and Silver
Limitations for copper and silver were applied in the previous permit under an established schedule of compliance. All data submitted by the permittee after the final limitation effective date for copper and silver was reported as below quantification levels and are considered absent for the purpose of this evaluation. However, in accordance with the agency anti-backsliding policy, the permit will retain the limitation of 19 ug/L total recoverable copper and 4.0 ug/L total recoverable silver. Previous reasonable potential evaluations for copper and silver showing how the limitations were calculated are included in **Attachment 8.**

Zinc
A permit limitation for zinc has not been previously established. Since the monitoring data from the last 5 years does not demonstrate a reasonable potential for zinc to impact water quality, monitoring for zinc is being eliminated from the permit.

Temperature:
The previous permit limitation for temperature of 45°C was evaluated based on chronic conditions to determine if the limitation was appropriate to protect against the rise above natural temperature of more than 3°C as listed in 9 VAC 25-260-60 of the Water Quality Standards. The agency default of 50:1 mixing in tidal waters was used. Additionally, the evaluation used the minimum ambient stream temperature for Cockrell Creek so that the most conservative evaluation was performed. The evaluation is as follows:

[(45°)*(1MGD) + (0.49°C)*(49 MGD)] / 50 MGD = 1.38°C which is the Mixed Temperature
Delta Temperature = 1.38°C – 0.49°C = 0.89°C

The permit limitation of 45°C for temperature is protective of the rise above natural temperature standard. The limitation is being carried forward with this permit reissuance.

Limitations Applicable to Outfalls 002 and 995

pH: 9 VAC 25-260-50, Class II Waters

Fecal Coliform and Enterococci: Limitations for Fecal Coliform and Enterococci are being applied to Outfalls 002 and 995 due to the wasteload allocations in the Cockrell Creek Bacteria TMDL. The wasteload allocations were based on bacterial concentration in 9 VAC 25-260-160 and 170 of the Virginia Water Quality Standards; therefore, the concentrations are being placed in the permit to demonstrate conformance with water quality management plans. The VDH – Department of Shellfish Sanitation has not designated a shellfish prohibition area surrounding Omega, and has indicated that they will not likely do so. As such, effluent from Omega must meet shellfish water quality standards at the end of pipe.

Outfall 002 Evaporator and Dryer Condensate, Boiler Blowdown Monitoring and Limitations

Parameter	Monitoring Frequency	Limitation	Basis
Flow (MGD)	Continuous	NL	Monitoring Only
Temperature	2 per Week	NL	Monitoring Only
pH	2 per Week	6.0 – 9.0 SU	Water Quality Standards
BOD_5	2 per Month	470 kg/d monthly average 840 kg/d maximum	Best Engineering Judgment
TSS	2 per Month	160 kg/d monthly average 410 kg/d maximum	Best Engineering Judgment
Oil and Grease	1 per Month	25 kg/d monthly average 46 kg/d maximum	Best Engineering Judgment
Ammonia	2 per Month	32.6 mg/L monthly average 40.2 mg/L maximum	Water Quality Standards
Total Phosphorous	1 per Week	2.0 mg/L, monthly average 2.0 kg/d, weekly average	Nutrient Policy for Nutrient Enriched Waters (9 VAC 25-40-10 et seq.)
Fecal Coliform	1 per Week	14 (N/100 mL) Geometric Mean	Water Quality Standards
Enterococci	1 per Week	35 (N/100 mL) Geometric Mean	Water Quality Standards
Whole Effluent Toxicity	1 per Quarter	14 TU_a	DEQ Toxic Management Policy

Outfall 995 Non-Contact Cooling Water Monitoring and Limitations

Parameter	Frequency	Limitation	Basis
Flow (MGD)	Continuous	NL	Monitoring Only
pH	5 per Week	6.0 – 9.0 SU	Water Quality Standards
Temperature	1per Day	45°C maximum	BEJ
Copper, Total Recoverable	1 per Quarter	19 ug/L monthly average 19 ug/L maximum	Water Quality Standards
Silver, Total Recoverable	1 per Quarter	4.0 ug/L monthly average 4.0 ug/L maximum	Water Quality Standards
Fecal Coliform	1 per Week	14 (N/100 mL) Geometric Mean	Water Quality Standards
Enterococci	1 per Week	35 (N/100 mL) Geometric Mean	Water Quality Standards

17. **Ground Water Monitoring Data Evaluation (Attachment 10)**

18. **Antibacksliding Statement**: All limitations in the proposed permit are the same or more stringent than the limitations in the 2005 permit.

19. **Compliance Schedules**: 9VAC 25-31-250 allows for schedules of compliance, when appropriate, which will lead to compliance with the Clean Water Act, the State Water Control Law and regulations promulgated under allows for them. Bacterial impairments on Cockrell Creek were addressed in a TMDL approved by the EPA on 12/8/2008 and by the SWCB on 4/28/2009. The TMDL established wasteload allocation for Fecal Coliform and Enterococci at Outfalls 002 and 995. Previously, there have been no bacterial limitations on the discharge from Outfall 995. Effluent documentation has indicated the presence of these bacteria in concentrations greater than the new limitations; therefore, it is appropriate to establish a schedule of compliance for the Fecal Coliform and Enterococci limitations at Outfall 995

No compliance schedule is being established for the revised bacterial or ammonia limitations at Outfall 002. Even though the revised limitations are more stringent than the limitations in the 2005 permit, DMR data demonstrates that the facility will be able to meet the revised limitations for Fecal Coliform, Enterococci, and ammonia on Outfall 002.

20. **Special Conditions**

Special Condition B.1 - Compliance Reporting
Rationale: Authorized by VPDES Permit Regulation, 9VAC 25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values. QLs for total recoverable copper and silver are based on the Outfall 995 Site Specific Target Values calculated based on acute and chronic wasteload allocations on the MSTRANTI spreadsheet.

Special Condition B.2 – Discharge and Monitoring of Refrigeration Water
Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. Included to ensure discharges meet water quality standards. Additional monitoring of refrigeration water has been included to characterize the discharge.

Special Condition B.3 – Notification Levels
Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200 A for all manufacturing, commercial, mining, and silvicultural dischargers.

Special Condition B.4 – Materials Handling/Storage
Rationale: 9VAC25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by the permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

Special Condition B.5 – Operation and Maintenance Manual Requirement
Rationale: Required by the Code of Virginia § 62.1-44.16; VPDES Permit Regulation, 9VAC25-31-190 E, and 40 CFR 122.41(e). These require proper operation and maintenance of the permitted facility. Compliance with an approved O&M manual ensures this.

Special Condition B.6 – Licensed Operator Requirement
Rationale: Required by VPDES Permit Regulation, 9VAC25-31-200 C and the Code of Virginia §54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.), requires licensure of operators. Because the licensed operator requirement generally applies to biological treatment processes, the requirement has been modified such that it only applies when the permittee uses the aerated lagoon and biological treatment process for process wastewaters or co-mingled wastewaters.

Special Condition B.7 – Best Management Practices
Rationale: VPDES Permit Regulation, 9VAC25-31-220 K, requires use of best management practices where applicable to control or abate the discharge of pollutants when numeric effluent limits are infeasible or the practices are necessary to achieve effluent limits or to carry out the purpose and intent of the Clean Water Act and State Water Control Law. Given the nature of the operations at this facility, this special condition reflects the best management practices associated with shipyard and vessel repair rather than the generalized best management plan condition. Conditions related to marine rail carriages have been removed as this does not apply to this facility. There are no graving docks at the site therefore, the shipyard condition Section IN-5, page 18 item a.(11) of the BMPs has not been included. Conditions 7.a.1.).a.(31) and (32) have been included to address specific site specific BMP needs.

Special Condition B.8– Reopeners
Rationale: 9VAC 25-40-70 A authorizes the DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction,

expansion or upgrade. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards. Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

Special Condition B.9– Facility Closure
Rationale: Required by Code of Virginia §62.1-44.16. This condition is used to notify the owner of the need for a closure plan where a treatment works is being replaced or expected to close.

Special Condition B.10– Ground Water Monitoring and Corrective Action Plan
Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. Ground water monitoring for parameters of concern will indicate whether possible lagoon seepage is resulting in violations to the State Water Control Board's Ground Water Standards.

Special Condition B.11– Water Quality Criteria Monitoring
Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact to Sate waters. To ensure that water quality standards are maintained, the permittee is required to analyze the facility's effluent for the substances noted.

Special Condition B.12 – Concept Engineering Report
Rationale: §62.1-44.16 of the Code of Virginia requires industrial facilities to obtain DEQ approval for proposed discharges of industrial wastewater. A CER means a document setting forth preliminary concepts or basic information for the design of industrial wastewater treatment facilities and the supporting calculations for sizing the treatment operations.

Special Condition B.13 – Outfall 002 Back-up Treatment
Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. This condition is included to ensure the proper handling of process wastewater in the event that the storage ponds are needed to store untreated process wastewater.

Special Condition B.14 – Storage Ponds
Rationale: The permittee is proposing to eliminate the aerated ponds from the treatment train for evaporator condensate; however, they desire to leave the ponds in place to be used on an emergency basis if needed. A minimum free board requirement has been added to prevent the discharge of pollutants to surface waters.

Special Condition B.15 – Bail Water Log
Rationale: State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. The permittee has indicated that bail water is not discharged to state waters. Recordkeeping is being required to demonstrate the proper handling and disposal of bail water.

Part I.C: Schedule of Compliance – Outfall 995
Rationale: 9 VAC 25-31-250 allows for schedules of compliance, when appropriate, which will lead to compliance with the Clean Water Act, the State Water Control Law and regulations promulgated under allows for them

Part I.D: Whole Effluent Toxicity Testing Requirements – Outfall 002
Rationale: VPDES Permit Regulation, 9VAC25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act.

Part II Conditions Applicable to All Permits
Rationale: VPDES Permit Regulation, 9VAC25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. **NPDES Permit Rating Work Sheet:** Total Score **60** **(See Attachment 11)**

22. **Changes to the Permit:**

2005 Permit Condition Num	2011 Permit Condition Num	Change
Permit Cover Page		Initial paragraph and signatory authority revised to reflect current agency guidance that incorporated the permit application as part of the permit.
Part I.A.1, 2,3,4,5	Removed	Outfall 001 eliminated.
Part I.A.6	Part I.A.1	Nutrient parameters [Total Nitrogen monthly average, monthly maximum, year to date, calendar year, TKN, Nitrate plus Nitrite, Total Phosphorous monthly maximum, year to date, calendar year, Orthophosphate] monitoring removed; superseded by the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia.
		Fecal Coliform Limitation changed from 200 N/100 mL to 14 N/100 mL.
		Flow Monitoring Sample Type updated from "Measured" to "TIRE."
		Ammonia limitations changing from 38 mg/L (45 mg/L) to 32.6 mg/L (40.2 mg/L) due to reasonable potential analysis.
Part I.A.7	Part I.A.1.a	Renumbered.
Part I.A.8	Part I.A.1 Footnote 2	Renumbered.
Part I.A.9	Removed	Former Schedule of Compliance; Final limitations now effective.
Part I.A.10	Removed	Covered under General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia.
Part I.A.11	Part I.A.1 Footnote 3	Monitoring Requirements moved to Part I.D Special Conditions; WET monitoring language updated to reflect current agency boilerplate in accordance with DEQ Central Office staff recommendations.
New	Part I.A.1 Footnote 4	Added in accordance with GM 07-2008 Amendment 2.
New	Part I.A.1 Footnote 1	Added to reflect GM 06-2016 regarding significant digits.
New	Part I.A.1.b	Added in accordance with GM10-2003 VPDES Permit Manual.
Part I.A.12, 13, 14, 15	Removed	Permit will no longer authorize discharge of condensate by barge via previously designated Outfall 003 to Chesapeake Bay.
Part I.A.16, 17, 18	Removed	This condition established combined limitations for Outfalls 001, 002, 003. With the elimination of Outfall 001 and discharges from Outfall 003 no longer being authorized under the VPDES permit, the combined limitations are no longer needed. Monitoring and limitations in this section have now been superseded by the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia.
Part I.A.19	Part I.A.2	Inclusion of bacteria limitations for Fecal Coliform and Enterococci to demonstrate compliance with TMDL WLA
		Zinc monitoring removed
		Flow Monitoring Sample changed from "Estimated" to "Calculated."
Part I.A.20	Part I.A.2.a	Renumbered.
Part I.A.21	Removed	Former Schedule of Compliance for Copper and Silver complete. Limitations now effective.

Part I.A.22	Part I.A.2 Footnote 2	Renumbered
New	Part I.A.2 Footnote 3	Schedule of Compliance added for facility to take appropriate measures to demonstrate compliance with the bacterial TMDL.
New	Part I.A.2.b	Added in accordance with GM 10-2003 VPDES Permit Manual.
Part I.B.1	Part I.B.1	Compliance Reporting: Updated in accordance with GM10-2003 VPDES Permit Manual.
Part I.B.2	Removed	Chesapeake Bay Discharge Outfall 003: Permit will no longer authorize discharge of condensate by barge via previously designated Outfall 003 to Chesapeake Bay.
Part I.B.3	Part I.B.2	Discharge and Monitoring of Refrigeration Water: Revised language to include definition of refrigeration water and add monitoring of refrigeration water prior to discharge; correction of buoy description from black can buoy to green can buoy and light name from Fleeton Point Light to Great Wicomico River Light in accordance with NOAA navigational charts.
Part I.B.4	Removed	Cockrell Creek Ambient Water Quality Monitoring: Data review performed by staff was inconclusive. See Staff Comments for further discussion.
Part I.B.5	Removed	Bacterial Effluent Limitation Monitoring Requirements: Guidance on Bacterial Effluent monitoring no longer included in permits in accordance with GM 10-2003 VPDES Permit Manual.
Part I.B.6	Part I.B.3	Notification Levels: Renumbered.
Part I.B.7	Part I.B.4	Materials Handling/Storage: Updated in accordance with GM 10-2003 VPDES Permit Manual.
Part I.B.8	Part I.B.8.d	Reopeners: Renumbered.
Part I.B.9	Part I.B.5	Operations and Maintenance Manual Requirements: Updated in accordance with GM10-2003 VPDES Permit Manual.
Part I.B.10	Part I.B.6	Licensed Operator Requirement: Renumbered.
Part I.B.11	Removed	Form 2C Monitoring: Submitted on 7/10/2006.
Part I.B.12	Removed	Lagoon Salinity Profile: Submitted on 1/19/2006.
Part I.B.13	Removed	Submitted 6/21/06. Additionally the outfall has since been eliminated; therefore the condition is no longer applicable.
Part I.B.14	Part I.B.7	Best Managemnt Practices: Updated in accordance with GM 10-2003 VPDES Permit Manual.
Part I.B.15	Removed	Boat Maintenance Ambient Water Quality Monitoring: Staff determined that monitoring plan for ambient water quality from boat maintenance activities is appropriate under the SW General Permit rather than the Individual Permit.
Part I.B.16	Removed	Schedule of Compliance (002 – Bacteria and Phosphorus; 995 – Copper and Silver): Complete. Limitations now in effect.
Part I.B.17	Removed	Oil Storage Ground Water Monitoring Reopener: Condition applies when groundwater monitoring is not included in the VPDES permit. Groundwater monitoring is included in this permit.
Part I.B.18	Part I.B.8	Reopeners: TMDL reopener is now included under a general reopener clause in accordance with GM 07-2008 Amendment 2.
Part I.B.19	Part I.B.8	Reopeners: Nutrient reopener is now included under a general reopener clause in accordance with GM 07-2008 Amendment 2.
Part I.B.20, 21, 22, 23	Removed	Nutrient Load Limitations and Monitoring Requirements: Superseded by the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia
Part I.B.24	Part I.B.11	Water Quality Criteria Monitoring: Revised to include Water Quality Criteria Monitoring for this permit issuance and submittal of Form 2C sampling
Part I.B.25	Part I.B.10	Ground Water Monitoring and Corrective Action Plan: Revised to reflect

		that plan exists and should be reviewed to ensure it is accurate. CAP language added.
New	Part I.B.9	Facility Closure: Added in accordance with GM10-2003; requirements included for freeboard maintenance since permittee intends to keep ponds on site for emergency storage.
New	Part I.B.12	Concept Engineering Report: Added in accordance with GM 07-2008 Amendment 2.
New	Part I.B.13	Back-up Treatment: This condition is included to ensure the proper handling of process wastewater in the event that the storage ponds are needed to store untreated process wastewater.
New	Part I.B.14	Storage Ponds: Included as a protective measure to prevent unauthorized discharge from storage pond.
Part I.C	Removed	Outfall 001 and 003 eliminated.
New	Part I.C.	Schedule of Compliance: Added for facility to take appropriate measures to demonstrate compliance with the bacterial TMDL at Outfall 995.

Change to the draft permit as a result of public comments received (See **Attachment 13** for the list of comments received and a response to comments):

2011 Permit Condition Num	Change
Part I.A.1 – Oil and Grease	The monitoring frequency has been reduced from two monitoring events per month to one per month.
Part I.A.1 – Fecal Coliform	The monitoring frequency has been changed to remove the requirement that monitoring be performed between 10 am and 4 pm.
Part I.A.1 – Enterococci	The monitoring frequency has been changed to remove the requirement that monitoring be performed between 10 am and 4 pm.
Part I.A.2 – Copper, Total Recoverable	The monitoring frequency has been reduced from one per month to once per quarter and the sample type has been changed from a 24-hour composite to a grab sample.
Part I.A.2 – Silver, Total Recoverable	The monitoring frequency has been reduced from one per month to once per quarter and the sample type has been changed from a 24-hour composite to a grab sample.
Part I.A.2 – Fecal Coliform	The monitoring frequency has been changed to remove the requirement that monitoring be performed between 10 am and 4 pm.
Part I.A.2 – Enterococci	The monitoring frequency has been changed to remove the requirement that monitoring be performed between 10 am and 4 pm.
Part I.B.2.a – Discharge and Monitoring of Refrigeration Water	The definition of refrigeration water has been updated to exclude the approximate temperature of 36°F.
Part I.B.2.e – Discharge and Monitoring of Refrigeration Water	The requirement that refrigeration water on each fishing vessel be monitored once per week has been reduced. The permittee must monitor refrigeration water twice per month during each month of the fishing season so as to monitor refrigeration water from each fishing vessel at least twice per fishing season over the term of the permit.
Part I.B.2.f – Discharge and Monitoring of Refrigeration Water	The requirement that the permittee monitor ambient water quality before and after the discharge of refrigeration water has been removed from the permit since they are now required to monitor the refrigeration water effluent. A condition was added in its place to specify that the discharge of refrigeration water should meet state water quality standards.
Part I.B.2.g – Discharge and Monitoring of Refrigeration Water	The requirement that the permittee perform Water Quality Criteria Monitoring on the refrigeration water of all ten fishing vessels has been reworded to further clarify the opportunity for the permittee to identify substantially identical discharges of refrigeration water.
Part I.B.6 – Licensed Operator Requirement	The licensed operator requirement has been revised such that it only applies at times when the permittee uses the aerated lagoon and biological treatment process during emergency storage.
Part I.B.15 – Bail Water Log	A condition has been added to the permit requiring the permittee to maintain a log of the handling of bail water. Specifically, the permittee must track the the date and volume of creek water withdrawn to be used as bail water; and the date and estimated volume of bail water disposed and manner and the location disposal.

23. **Variances/Alternate Limits or Conditions**: None

24. **Public Notice Information required by 9 VAC 25-31-280 B**:
All pertinent information is on file and may be inspected, and copied by contacting

Ms. Jaime Bauer
Virginia DEQ Piedmont Regional Office
949-A Cox Road
Glen Allen, VA 23060
Telephone No. (804) 527-5015
Email Address: Jaime.Bauer@deq.virginia.gov

DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1)The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual request for a public hearing, and there are substantial, disputed issues relevant to the permit. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at the DEQ Piedmont Regional Office by appointment or may request copies of the documents from the contact permit listed above.

25. **Additional Comments**:

Previous Board Action: None

Staff Comments:

- As previously described, the fishing vessels take on seawater to be used as refrigeration water that is run through chillers to keep the fish cold until returning to the plant. The refrigeration water is discharged prior to the offloading of the fish. Discharges of refrigeration water must be performed outside of Cockrell Creek east of the line of Great Wicomico River Light and Green Can Buoy #3. At the June 27, 1982 State Water Control Board (SWCB) meeting agency staff made a presentation to the Board indicating the need to address refrigeration water under the VPDES program. Prior to the SWCB meeting, the Attorney General's Office deemed that the refrigeration water is process water, not harvesting water. Additionally, EPA did not address refrigeration water in the Effluent Guideline Limitations for Fish Meal Processing Facilities. EPA advised agency staff that limitations for the refrigeration water should be addressed based on Best Professional Judgment. In order to do this staff needed to characterize the discharge. However, no further documentation exists in the file showing the characterization of refrigeration water. In recent permit iterations, the permittee was required to monitor ambient water conditions prior to and after the discharge of refrigeration water to ensure that the discharge of refrigeration water does not contribute to the impairment of the receiving waters. The permittee will now be required to monitor the refrigeration water discharged rather than the ambient water quality before and after discharge. This permit also requires Water Quality Criteria Monitoring to be performed on the refrigeration water discharges at least one time per vessel during the term of this permit unless the DEQ approves a petition from the permittee for substantially identical discharges. Additionally, regular monitoring of select parameters is also required. The data collected from the monitoring of the refrigeration water will allow agency staff to determine if the discharge of refrigeration is impacting water quality in the Chesapeake Bay.

- Limitations and monitoring for storm water are required under the VPDES permit regulation, 9 VAC 25-31-

220A, and EPA's storm water effluent limitation guidelines in the Code of Federal Regulations at 40 CFR Part 429, Part 418, Part 443, Part 411, and Part 423. Storm water discharges exposed to industrial activities from the shipyards are regulated under general permit VAR051211 for the Reedville side; VAR051221 for the Fairport side. A barge operation to ship fishmeal by water also occurs at the facility. However, no discharge to state waters is being allowed from this activity. BMPs and Storm Water Pollution Prevention Plans are implemented through the storm water general permits to ensure no adverse discharge of pollutants to state waters occurs from the activity. It is suggested that the monitoring of the ambient water quality at the boat maintenance areas be incorporated into the sites' BMP and Storm Water Pollution Prevention Plans.

- During effluent limitation analysis and development for the December 2005 permit, the most recent 10 years of ambient water quality data rather than the period of record (1968 to 2003) was used in the calculation of the wasteload allocations for Outfall 001, 002, and 995 because the period of record was not believed to be representative of current ambient conditions. The permittee was required to establish an in-stream monitoring plan for Cockrell Creek (Special Condition Part I.B.4) to provide a complete and current record with which to determine compliance with the ammonia water quality standards. The plan included monthly monitoring for temperature, pH, salinity and ammonia at three locations 20 feet from Outfalls 001, 002, and 995 and was approved by the DEQ Piedmont Regional Office on January 13, 2006. As part of the 2011 permit reissuance, the ambient water quality data for Cockrell Creek was reviewed (**Attachment 12**). Staff has determined that the collected data is inconclusive as to the impact of the discharges of ammonia on the water quality of Cockrell Creek as it appears as though the data may have been collected within the regulatory approved mixing zone for each outfall. Additionally, review of the data collected at DEQ monitoring stations upstream and downstream of the discharge does not indicate any violations of the water quality standard for ammonia. Therefore, the in-stream monitoring plan is being discontinued.

- § 62.1-44.19:15. A. of the *Code of Virginia* requires owners or operators of expanded facilities to offset any increase in delivered total nitrogen and delivered total phosphorus loads resulting from any expansion beyond the waste load allocations or permitted design capacity as of July 1, 2005, and requires owners or operators of new facilities to offset the entire delivered total nitrogen and total phosphorus loads discharged. It is noted that for Outfall 002, the maximum 30 day flow increased from 0.249 MGD in the 2005 permit application to 0.265 MGD with the 2011 permit application. The increase is a result in the variability of production that occurs from industrial facilities. The long term average flow from Outfall 002 has decreased as the facility now reuses treated wastewater for various processes in the plant. There have been no activities at the plant that qualify as an expansion. Therefore, annual average nutrient concentration limitations are not being included in the permit.

- As previously explained in Item 9, the permittee is proposing to eliminate the use of the aerated ponds, DAF, and UV disinfection units from the Outfall 002 treatment train. The permittee is proposing to leave the ponds on site for emergency storage. The discharge of any water, including storm water, collected in the ponds and discharged through Outfall 002 must meet the limitations for Outfall 002 specified in Part I.A.1 of the permit.

- As explained in Item 26 below, maximum wasteloads for fecal coliform and Enterococci have been allocated to the facility for Outfalls 002 and 995 to comply with the Cockrell Creek TMDL. The permittee contends that these allocations were applied in error and does not believe that they are a source of bacteria contributing to the impairment of Cockrell Creek and the unnamed tributary to Cockrell Creek. While the DEQ performed a bacteriological study during the TMDL development which concluded that the permittee is a bacteria source, the permittee disagrees with that assessment. The State Water Control Board approved the TMDL on April 28, 2009. Consequently, the permittee has proposed to conduct further bacteriological studies in collaboration with the DEQ and Virginia Institute for Marine Science (VIMS). The DEQ water planning and monitoring staff is coordinating with the permittee on these additional studies. If the DEQ concludes that the bacterial wasteload allocations are no longer necessary for the facility and the TMDL is modified to remove the facility's wasteload allocations prior to the final effective date of fecal coliform and Enterococci limitations at Outfall 002 and 995, then the permittee may apply for a major permit modification to address the bacterial limitations.

EPA Comments: EPA was provided a 30 day comment period that began on March 22, 2011 and ended on April 21, 2011. No comments were received during that review period. An additional 30 day comment period

was provided to EPA beginning on May 6, 2011 and lasting until June 6, 2011 to review changes to the proposed permit that resulted from comments received during the public comment period. During their second review, EPA provided the following comment via an e-mail from Mark Smith on June 3, 2011: "We received the revised draft permit for Omega Protein on 5/6/11. In the interest of focusing available resources, EPA has exercised its discretion in the review of this state-submitted draft permit and has chosen to perform a limited review on the Chesapeake Bay and TMDL requirements. As a result of this limited review, we have the following comment related to the Chesapeake Bay requirements. A citation should be added to the Omega individual permit (VA0003867) that 9 VAC 25-720 also applies." 9 VAC 25-720 refers to the Water Quality Management Plan that establishes nutrient wasteload allocations. Since the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed addresses the issue of nutrient wasteload allocations and is cited in the Part I.A.1 footnotes, DEQ staff determined it was not necessary to revise the permit and informed EPA of this decision in a phone call on June 8, 2011. No changes to the proposed permit occurred as a result of EPA's comment.

VDH Comments: The permit application was sent to VDH in accordance with GM10-2003. VDH returned a memo acknowledging receipt of the application and indicating that there are no public water supply intakes located within 15 miles downstream of the discharges. No other comments were received.

Public Notice Comments: Comments were received from the owner and an environmental interest group by email during the 30-day public comment period. No comments were received by fax or written letter. The comments were submitted in full compliance with the information requirements outlined in 9 VAC25-230-40 of Procedural Rule No. 1. Based on the comments received, the DEQ Piedmont Regional Office concluded that the comments could be sufficiently addressed in writing and with changes to the draft permit; therefore, no public hearing is necessary. See **Attachment 13** for the list of comments received and a response to comments.

Other Agency Comments: No comments received

Owner Comments: The owner submitted comments during the public comment period. See **Attachment 13** for the list of comments received and a response to comments.

Planning Conformance Statement: The discharge is in conformance with the existing planning documents for the area.

Have all applicable permit fees been paid? Yes

Is this project/discharge considered to be controversial? Yes. During the term of the 2005 permit as well as years prior, there has been significant interest from the public and nonprofit environmental groups regarding the permitted activities at this facility.

E-DMR Status: The facility has been enrolled in the eDMR program since May 2008.

Virginia Environmental Excellence Program (VEEP): This facility is not a participant in the VEEP program.

26. **303(d) Listed Segments (TMDL):**

In the 2010 Water Quality Assessment the Cockrell Creek segments to which outfalls 002 and 995 discharge were assessed as Category 5D waters ("The Water Quality Standard is not attained where TMDLs for a pollutant(s) have been developed but one or more pollutants are still causing impairment requiring additional TMDL development.") The Aquatic Life Use is impaired due to inadequate SAV in the Chesapeake Bay 5 Mesohaline (CB5MH) estuary; estuarine bioassessments is an observed effect. The Fish Consumption Use is impaired due to the VDH Fish Consumption Advisory for PCBs and arsenic is an observed effect due to a screening value exceedance. The Recreation Use is impaired due to enterococci; the bacterial TMDL was approved by the EPA on 12/8/2008. The Wildlife Use is fully supporting. Lower Cockrell Creek to which outfall 002 discharges is impaired for the Shellfishing Use; the bacterial TMDL was

approved on 12/8/2008. Previously, the segment of Cockrell Creek to which outfall 995 discharges was considered impaired for Shellfish Use; however, the Shellfish Use was removed for that segment because VDH considers the area to be administratively condemned.

The bacterial impairments on Cockrell Creek were addressed in a TMDL which was approved by the EPA on 12/8/2008 and by the SWCB on 4/28/2009. The TMDL states that "DEQ conducted a special study around the Omega Protein, Inc. facility from August 2006 to February 2007. Data collected from this study shows high bacteria counts in the waters surrounding the facility and from the industrial discharge. This data indicates the facility is a significant contributor to the bacterial impairments in Cockrell Creek." Outfall 002 was assigned a fecal coliform wasteload allocation of 2.55E+08 MPN/day and outfall 995 received a wasteload allocation of 7.52E+09 MPN/day to address the Shellfish Use impairment. The TMDL states that "effluents from the Omega facility must meet the shellfish water quality standard at the end of pipe." In addition, the outfalls received enterococci wasteload allocations of 6.37E+08 MPN/day and 1.88E+10 MPN/day, respectively, in order to address the Recreation Use impairment.

Compliance monitoring of Fecal Coliform and Enterococci discharged from Outfall 002 demonstrate compliance with wasteload allocations. Upon achievement of final limitations included in the Part I.A. page for Outfall 995 for Fecal Coliform and Enterococci, the permittee will also be able to demonstrate compliance with the wasteload allocations. Compliance with the allocations is demonstrated as follows based on the concentration limitations included in Part I.A of the permit and maximum flow data reported in Form 2C of the permit application:

			Fecal Coliform			**Enterococci**		
Outfall	Max Flow (MGD)	Max Flow (mL/day)	Concentration (MPN/100 mL)	Expected Loading (MPN/day)	TMDL WLA (MPN/day)	Concentration (MPN/100 mL)	Expected Loading (MPN/day)	TMDL WLA (MPN/day)
002	0.32	1,211,331,776	14	1.70E+08	2.55E+08	35	4.24E+08	6.37E+08
995	4.212	15,944,154,502	14	2.23E+09	7.52E+09	35	5.58E+09	1.88E+10

The Omega Protein facility was also included in the Chesapeake Bay TMDL which was approved by the EPA on 12/29/2010. The TMDL addressed all dissolved oxygen and SAV impairments in the Chesapeake Bay and its tidal tributaries. The facility received the following annual wasteload allocations:

- 21,213 lbs of total nitrogen
- 1,591 lbs of total phosphorus
- 352,836 lbs of total suspended solids

Compliance with the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed will result in the demonstration of compliance with the wasteload allocations for total nitrogen and total phosphorus in the Chesapeake Bay TMDL. Therefore, no limitations on total phosphorous and total nitrogen are necessary in the individual permit. Discussions with DEQ Central Office staff indicated that the TSS wasteload allocation assigned to the facility was based on TSS loading permit limitations from Outfall 001 (no longer in existence) and Outfall 002 only with the plant operating 198 days year due to the seasonal nature of the business, and are not based on the non-contact cooling water discharge. The load limitation in Outfall 002 ensures that the facility's discharge will not further contribute to impairment in Cockrell Creek.

Due to the nature of the operations of the fish processing plant, the facility is not expected to contribute PCBs or arsenic that may cause further water quality concerns.

See **Attachment 14** for the TMDL Fact Sheets.

27. **Nutrient requirements:** The permittee is considered a significant discharger of nutrients to the Chesapeake Bay watershed and is subject to the requirements of the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed. The Total Nitrogen and Total Phosphorus calendar year load limits associated with this facility

are included in the current Registration List for the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Dischargers and Nutrient Trading in the Chesapeake Watershed in Virginia, under registration number VAN20037.

28. **Summary of Attachments**

1. Flow Frequency Memo
2. Facility Operations Diagram
3. Topographic Map
4. Ambient Monitoring Data for 7-COC001.61
5. 1976 VIMS Model for Cockrell Creek
6. Inspection Report
7. Effluent Limitation Development – Outfall 002
8. Effluent Limitation Development – Outfall 995
9. Whole Effluent Toxicity Testing Evaluation – Outfall 002
10. Ground Water Monitoring Data Evaluation
11. NPDES Permit Rating Spreadsheet
12. Cockrell Creek Ambient Monitoring Data
13. Summary of Comments Received During the Public Comment Period and Response
14. TMDL Fact Sheets

Attachment 1 – Flow Frequency Memo

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
Omega Proteins, Inc. – VA0003867

TO: Jaime Bauer

FROM: Jennifer Palmore, P.G.

DATE: January 28, 2011

COPIES: File

The Omega Proteins, Inc. facility is located near Reedville in Northumberland County, VA. Omega discharges via outfall 995 to Cockrell Creek and via outfall 002 to an unnamed tributary of Cockrell Creek. Outfall 002 is located at rivermile 7-XAN000.14 and outfall 995 is located at rivermile 7-COC001.00. Flow frequencies have been requested at this site for use by the permit writer in developing effluent limitations for the VPDES permit.

Cockrell Creek and its tributary are tidally influenced at the discharge points. Flow frequencies cannot be determined for tidal waters, therefore the previously-determined dilution ratios (002: van Soestbergen, 9/17/1998; 995: default ratios) should be used to evaluate the effluent's impact on the waterbody. The Virginia Water Quality Standards classify Cockrell Creek as an estuarine waterbody; therefore the aquatic life saltwater criteria should be applied.

During the 2008 305(b)/303(d) Water Quality Assessment, Cockrell Creek at the discharge points was considered a Category 5A water ("A Water Quality Standard is not attained. The water is impaired or threatened for one or more designated uses by a pollutant(s) and requires a TMDL (303d list).") The applicable fact sheets are attached. The Aquatic Life Use was impaired due to violation of the Chesapeake Bay Water Quality Standards for the Chesapeake Bay 5 Mesohaline (CB5MH) estuary; the estuary violated the submerged aquatic vegetation (SAV) acreage criteria. In addition, estuarine bioassessments is considered a non-impairing observed effect due to an impacted benthic population at a probabilistic monitoring station. The Fish Consumption Use was impaired due to a VDH Fish Consumption Advisory for PCBs in anadromous striped bass; in addition, arsenic is an observed effect due to a screening value exceedance. The Shellfishing Use was impaired due to VDH shellfish condemnation. The Recreation Use was impaired due to enterococci exceedances. The Wildlife Use was not assessed.

In the draft 2010 Assessment, the Cockrell Creek assessment unit was split and outfalls 002 and 995 are now assessed slightly differently. Both segments are considered Category 5D waters ("The Water Quality Standard is not attained where TMDLs for a pollutant(s) have been developed but one or more pollutants are still causing impairment requiring additional TMDL development.") The fact sheets are attached. The Aquatic Life Use remains impaired due to inadequate SAV in the CB5MH estuary; estuarine bioassessments is an observed effect. The Fish Consumption Use is impaired due to the VDH Fish Consumption Advisory for PCBs and arsenic is an observed effect due to a screening value exceedance. The Recreation Use is impaired due to enterococci; the bacterial TMDL was approved by the EPA on 12/8/2008. The Wildlife Use is fully supporting. The difference between the segments is that lower Cockrell Creek remains impaired for the Shellfishing Use; the bacterial TMDL was approved on 12/8/2008. However, the Shellfish Use was removed for the segment of Cockrell Creek to which outfall 995 discharges because VDH considers the area to be administratively condemned.

As mentioned above, the bacterial impairments on Cockrell Creek were addressed in a TMDL which was approved by the EPA on 12/8/2008 and by the SWCB on 4/28/2009. The TMDL states that "DEQ conducted a special study around the Omega Protein, Inc. facility from August 2006 to February 2007. Data collected from this study shows high bacteria counts in the waters surrounding the facility and from the industrial discharge. This data indicates the facility is a significant contributor to the bacterial impairments in Cockrell Creek." Outfall 002 was assigned a fecal coliform wasteload allocation of 2.55E+08 MPN/day and outfall 995 received a wasteload allocation of 7.52E+09 MPN/day to address the Shellfish Use impairment. The TMDL states that "effluents from the Omega facility must meet the shellfish water quality standard at the end of pipe." In addition, the outfalls received enterococci wasteload allocations of 6.37E+08 MPN/day and 1.88E+10 MPN/day, respectively, in order to address the Recreation Use impairment.

The Omega Protein facility was also included in the Chesapeake Bay TMDL which was approved by the EPA on 12/29/2010. The TMDL addressed all dissolved oxygen and SAV impairments in the Chesapeake Bay and its tidal tributaries. The facility received the following annual wasteload allocations:

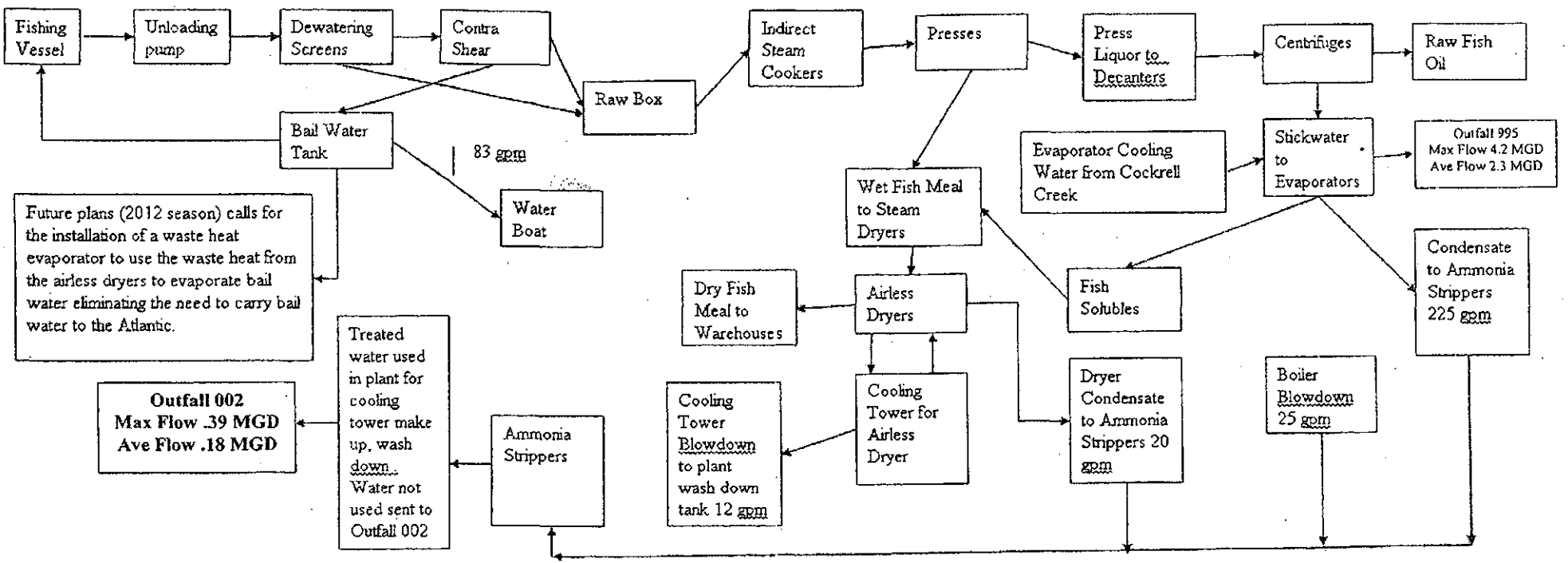
- 21,213 lbs of total nitrogen
- 1,591 lbs of total phosphorus
- 352,836 lbs of total suspended solids

Water quality data from monitoring station 7-COC001.61 is attached. The station is located on Cockrell Creek approximately 0.6 mile upstream of the facility at the end of Main Street in Reedville.

During the 1979 modeling by VIMS, dischargers on Cockrell Creek were allocated 5,000 lbs/day of $cBOD_5$ "in order that 5.0 mg/L of DO will be maintained in the upper layer of that receiving stream". As 5.0 mg/L was the minimum dissolved oxygen standard at the time, and remains the 30-day mean standard, Cockrell Creek was considered to be fully allocated and therefore is considered a Tier 1 water.

If you have any questions concerning this analysis, please let me know.

Attachment 2 – Facility Operations Diagram


Fishing Vessel
Unloading pump
Dewatering Screens
Contra Shear
Raw Box
Indirect Steam Cookers
Presses
Press Liquor to Decanters
Centrifuges
Raw Fish Oil
Bail Water Tank
83 gpm
Water Boat
Future plans (2012 season) calls for the installation of a waste heat evaporator to use the waste heat from the airless dryers to evaporate bail water eliminating the need to carry bail water to the Atlantic.
Wet Fish Meal to Steam Dryers
Evaporator Cooling Water from Cockrell Creek
Stickwater to Evaporators
Outfall 995 Max Flow 4.2 MGD Ave Flow 2.3 MGD
Condensate to Ammonia Strippers 225 gpm
Fish Solubles
Dry Fish Meal to Warehouses
Airless Dryers
Dryer Condensate to Ammonia Strippers 20 gpm
Boiler Blowdown 25 gpm
Cooling Tower for Airless Dryer
Cooling Tower Blowdown to plant wash down tank 12 gpm
Treated water used in plant for cooling tower make up, wash down. Water not used sent to Outfall 002
Ammonia Strippers
Outfall 002 Max Flow .39 MGD Ave Flow .18 MGD

Attachment 3 – Topographic Map

Map provided by MyTopo.com

Attachment 4 – Ambient Monitoring Data for 7-COC001.61

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Salinity	Secchi Depth
7-COC001.61	10/21/1993	S	0.3	19.1	7.87	8		18	
7-COC001.61	12/13/1993	S	0.3	6.02	7.8		**0.57**		
7-COC001.61	2/16/1994	S	0.3	2.7	8.19	14.4		13	
7-COC001.61	4/6/1994	S	0.3	12.4	8.48	11.3		10	
7-COC001.61	6/7/1994	S	0.3	23.1	8.08	7.2		10	
7-COC001.61	8/9/1994	S	0.3	24.6	8.1	8.2		13.5	
7-COC001.61	12/15/1994	S	0.3	7.7	8.08	9.5		16.5	
7-COC001.61	2/9/1995	S	0.3	0.8	8.85	12.8		16	
7-COC001.61	6/12/1995	S	0.3	26.7	7.83	7.15		17.2	
7-COC001.61	8/11/1995	S	0.3	28.45	8.24	7.07		19.1	1.1
7-COC001.61	8/11/1995	M	1	28	8.2	6.44		19.3	
7-COC001.61	8/11/1995	M	3	27	7.96	**3.85**		19.3	
7-COC001.61	8/11/1995	B	4	26.85	7.88	**3.3**		19.3	
7-COC001.61	9/13/1995	S	0.3	24.98	8.05	6.36		22	
7-COC001.61	12/11/1995	S	0.3	4.09	7.8	11.06		21.2	
7-COC001.61	3/18/1996	S	0.3	7.73	7.57	11.09		14.3	
7-COC001.61	6/20/1996	S	0.3	29.5	8.65	10.31		11.8	
7-COC001.61	9/19/1996	S	0.3	22.97	7.63	6.4		13.2	
7-COC001.61	12/12/1996	S	0.3	6.61	7.75	11.73		12.2	
7-COC001.61	3/10/1997	S	0.3	9.74	8.29	12.37		9.9	
7-COC001.61	6/5/1997	S	0.3	20.56	7.66	8.32		12.9	
7-COC001.61	7/28/1997	S	0.3	28.53	7.72	6.62		15.2	
7-COC001.61	9/16/1997	S	0.3	26.33	7.82	7.42		17	
7-COC001.61	11/17/1997	S	0.3	10.03	8.05	8.16		19.1	
7-COC001.61	1/13/1998	S	0.3	7.83	8	8.52		20	
7-COC001.61	3/11/1998	S	0.3	8.29	8.38	11.69		13.2	
7-COC001.61	5/14/1998	S	0.3	15.98	7.57	6.85		10.4	
7-COC001.61	7/13/1998	S	0.3	27.2	8.26	6.83		12.2	
7-COC001.61	8/24/1998	S	1	28.4	8.07	8.28		16.3	0.5
7-COC001.61	9/8/1998	S	0.3	27.01	7.93	7.23		18.8	
7-COC001.61	9/8/1998	M	1	27.02	7.9	7.28		18.8	0.8
7-COC001.61	9/8/1998	B	2	27.02	7.86	7.35		18.8	
7-COC001.61	9/15/1998	S	0.3	26.08	8.15	8.33		15.6	
7-COC001.61	9/21/1998	S	0.3	26.61	8.17	7.53		16.4	
7-COC001.61	9/21/1998	M	1	26.06	8.09	6.2		16.6	0.7
7-COC001.61	9/21/1998	M	2	25.87	7.79	**4.12**		16.6	
7-COC001.61	9/21/1998	B	2.7	25.85	7.62	**3.11**		16.7	
7-COC001.61	10/8/1998	S	2.9	20.94	7.87	6.17		17.3	
7-COC001.61	10/8/1998	S	0.3	21.12	8.09	7.47		17.9	
7-COC001.61	10/8/1998	M	1	21.12	8.09	7.47		17.9	0.5
7-COC001.61	10/8/1998	B	2	21.03	8.06	7.37		17.8	
7-COC001.61	10/22/1998	S	0.3	17.74	7.71	6.65		20.5	
7-COC001.61	10/22/1998	M	1	17.76	7.7	6.61		20.5	0.7
7-COC001.61	10/22/1998	B	1.7	17.73	7.64	6.77		20.5	
7-COC001.61	11/5/1998	S	0.3	13.41	7.7	7.22		21.8	
7-COC001.61	11/5/1998	M	1	13.41	7.7	7.25		21.8	0.8
7-COC001.61	11/5/1998	B	2.1	13.41	7.68	7.25		21.8	
7-COC001.61	11/16/1998	S	0.3	12.2	8.02	10.34		19	
7-COC001.61	11/19/1998	S	0.3	12.54	8.28	12		17.5	
7-COC001.61	11/19/1998	M	1	12.34	8.27	11.74		17.5	0.7
7-COC001.61	11/19/1998	M	2	12.43	8.2	11.37		17.5	
7-COC001.61	11/19/1998	B	2.7	12.44	8.05	11.55		17.6	
7-COC001.61	1/13/1999	S	0.3	3.96	7.58	14.01		21.5	
7-COC001.61	3/15/1999	S	0.3	5.22	7.7	10.4		22.1	
7-COC001.61	5/10/1999	S	0.3	22.35	8.02	9.4		16	
7-COC001.61	5/10/1999	S	1	22.2	8.02	8.9		16	0.8
7-COC001.61	5/10/1999	B	1.4	22	8.02	9.34		16	
7-COC001.61	5/12/1999	S	0.3	22.41	8.42	9.7		16.8	
7-COC001.61	5/24/1999	S	0.3	22.98	7.92	6.75		18	
7-COC001.61	5/24/1999	S	1	22.98	7.92	6.78		18	0.9
7-COC001.61	5/24/1999	B	1.4	22.96	7.81	6.63		18	
7-COC001.61	6/7/1999	S	0.3	26.82	8.54	8.69		16.5	
7-COC001.61	6/7/1999	S	1	25.73	8.55	8.09		16.7	0.5
7-COC001.61	6/21/1999	S	0.3	22.03	8.39	8.57		17.1	
7-COC001.61	6/21/1999	S	1	22.03	8.37	8.51		17.1	0.4
7-COC001.61	6/21/1999	B	1.5	22.01	8.36	8.61		17.1	
7-COC001.61	7/1/1999	S	0.3	27.6	8.25	7.5		19.6	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Salinity	Secchi Depth
7-COC001.61	7/1/1999	S	1	27.2	8.2	6.7		20	0.6
7-COC001.61	7/13/1999	S	0.3	25.41	8.13	5.34		17.3	
7-COC001.61	7/22/1999	S	0.3	28.22	8.54	8.27		17.3	
7-COC001.61	7/22/1999	S	1	28.07	8.35	6.01		17.5	0.5
7-COC001.61	7/22/1999	B	1.4	27.95	8.19	**4.36**		17.7	
7-COC001.61	8/4/1999	S	0.3	29.96	8.51	9.31		17.8	
7-COC001.61	8/4/1999	S	1	29.94	8.49	9.22		17.9	0.4
7-COC001.61	8/19/1999	S	0.3	28.98	8.39	7.53		24	
7-COC001.61	8/19/1999	S	1	28.95	8.37	7.5		24	0.5
7-COC001.61	9/2/1999	S	0.3	21.51	8.23	8.37		21.4	
7-COC001.61	9/2/1999	S	1	21.5	8.22	8.35		21.4	0.7
7-COC001.61	9/14/1999	S	0.3	25.52	7.99	8.04		17.7	
7-COC001.61	9/29/1999	S	0.3	23.43	7.98	7.49		22.8	
7-COC001.61	9/29/1999	S	1	23.01	7.92	7.12		23.1	1.1
7-COC001.61	9/29/1999	B	1.7	22.83	7.85	6.74		23.4	
7-COC001.61	10/6/1999	S	0.3	20.43	8.06	7.96		20	
7-COC001.61	10/6/1999	S	1	20.17	8.06	7.89		20.7	0.9
7-COC001.61	10/21/1999	S	0.3	17.04	7.7	8.17		17.5	1.1
7-COC001.61	10/21/1999	B	1.1	17.11	7.69	7.93		17.5	
7-COC001.61	11/8/1999	S	0.3	13.66	7.95	7.06		19.5	
7-COC001.61	1/24/2000	S	0.3	1.28	7.87	11.74		19.8	
7-COC001.61	3/16/2000	S	0.3	12.61	8.16	10.28		17.1	
7-COC001.61	5/18/2000	S	0.3	25.06	8.21	8.25	8.2	13.2	
7-COC001.61	5/23/2000	S	0.3	21.55	8.16	8.28		14.01	
7-COC001.61	5/23/2000	S	1	21.54	8.15	8.24		14.01	0.6
7-COC001.61	6/14/2000	S	0.3	25.75	8.01	6.07		14	
7-COC001.61	6/14/2000	S	1	25.69	7.98	**4.46**		14	0.6
7-COC001.61	6/14/2000	M	2	25.52	7.86	**4.78**		14.1	
7-COC001.61	6/14/2000	M	2.5	25.34	7.83	**3.66**		14.1	
7-COC001.61	7/6/2000	S	0.3	29.91	8.29	7.44		13.8	
7-COC001.61	7/6/2000	B	1	28.89	8.22	6.16		14	0.2
7-COC001.61	7/12/2000	S	0.3	27.9	8.45	7.65	8.2	14.51	
7-COC001.61	8/1/2000	S	0.3	28.8	8.57	10.15		13	
7-COC001.61	8/1/2000	B	1	28.58	8.54	9.62		13	0.6
7-COC001.61	9/5/2000	S	0.3	25.56	7.51	**3.83**		14.3	
7-COC001.61	9/5/2000	B	1	25.6	7.5	**3.83**		14.2	1.1
7-COC001.61	9/7/2000	S	0.3	23.47	7.57	7.14		14.4	
7-COC001.61	10/26/2000	S	0.3	18.76	7.99	8.15		16.2	
7-COC001.61	10/26/2000	B	1	18.36	7.99	8.15		16.2	0.8
7-COC001.61	11/7/2000	S	0.3	13.61	8.14	9.77		16.42	
7-COC001.61	1/3/2001	S	0.3	1.05	7.9	12.21		20.5	
7-COC001.61	3/7/2001	S	0.3	5.22	7.95	10.81		17.02	
7-COC001.61	5/15/2001	S	0.3	21.5	7.77	6.6		15.6	
7-COC001.61	7/17/2001	S	0.3	28.42	8.14	8.19		15.86	
7-COC001.61	9/24/2001	S	0.3	24.98	7.79	8.51		17.74	
7-COC001.61	11/19/2001	S	0.3	13.57	7.88	9.15		19.6	
7-COC001.61	1/15/2002	S	0.3	5.55	7.51	11.81		20.8	
7-COC001.61	4/1/2002	S	0.3	13.8	8.06	8.58		19.61	
7-COC001.61	5/1/2002	S	0.3	20.31	8.1	9.79		18.52	
7-COC001.61	8/28/2002	S	0.3	26.41	7.37	**4.5**		19.23	
7-COC001.61	10/28/2002	S	0.3	15.96	7.49	7.86		21.68	
7-COC001.61	2/5/2003	S	0.3	3.64	7.89	13.79		15.93	
7-COC001.61	4/29/2003	S	0.3	19.64	7.96	9.79		10.9	
7-COC001.61	6/11/2003	S	0.3	25.29	8.29	9.16		11.97	
7-COC001.61	8/4/2003	S	0.3	28.55	8.11	7.52		12.55	
7-COC001.61	10/6/2003	S	0.3	19.7	7.85	7.54		12.65	
7-COC001.61	12/15/2003	S	0.3	6.3	8.44	12.7		11.8	
7-COC001.61	3/11/2004	S	0.3	7.99	8	11.51		12.22	
7-COC001.61	4/27/2004	S	0.3	19.55	8.58	10.26		11.3	
7-COC001.61	6/8/2004	S	0.3	27.75	8.02	8.1		11.95	
7-COC001.61	6/24/2004	S	0.3	26.54	8.42	7.15		12.58	
7-COC001.61	7/8/2004	S	0.3	28.81	8.14	5.83		13.08	
7-COC001.61	7/28/2004	S	0.3	27.63	7.98	7.66		12.14	
7-COC001.61	8/16/2004	S	0.3	24.93	7.77	5.2		13.08	
7-COC001.61	9/20/2004	S	0.3	21.63	7.96	8.18		13.83	
7-COC001.61	9/27/2004	S	0.3	23.93	8.45	8.56		13.2	
7-COC001.61	10/20/2004	S	0.3	16.97	8.07	8.24		11.39	

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler	Salinity	Secchi Depth
7-COC001.61	11/18/2004	S	0.3	10.74	8.32	12.82		11.71	
7-COC001.61	11/29/2004	S	0.3	11.14	8.61	11.6		12.6	
7-COC001.61	1/31/2005	S	0.3	0.49	8.24	13.41		10.87	
7-COC001.61	3/30/2005	S	0.3	13.56	8.27	12.69		11.14	
7-COC001.61	5/9/2005	S	0.3	16.88	8.31	10.8		9.83	
7-COC001.61	5/23/2005	S	0.3	21.25	8.46	6.5		10.77	
7-COC001.61	6/9/2005	S	0.3	27.02	7.69	6.38		10.58	
7-COC001.61	6/28/2005	S	0.3	29.51	8.31	7.13		11.9	
7-COC001.61	7/18/2005	S	0.3	30.83	8.16	6.7		12.79	
7-COC001.61	8/8/2005	S	0.3	31.16	8.54	9.36		13.96	
7-COC001.61	9/13/2005	S	0.3	27.44	8.04	6.37		16.74	
7-COC001.61	9/13/2005	S	0.3	27.44	8.04	6.37		16.74	
7-COC001.61	10/25/2005	S	0.3	16.26	7.74	7.75		17.57	
7-COC001.61	11/8/2005	S	0.3	16.22	8.05	8.75		16.23	
7-COC001.61	11/16/2005	S	0.3	15.65	8.23	9.78		17.55	
7-COC001.61	2/2/2006	S	0.3	6.84	8.31	12.13		13.72	
7-COC001.61	5/23/2006	S	0.3	21.2	8	7.7		14.9	
7-COC001.61	5/30/2006	S	0.3	26.3	8	7.6		15.3	
7-COC001.61	6/28/2006	S	0.3	27.7	8.1	6.4		15.2	
7-COC001.61	7/20/2006	S	0.3	31.3	8.3	7		15.4	
7-COC001.61	7/26/2006	S	0.3	28.7	8.2	7.6		15.3	
7-COC001.61	8/28/2006	S	0.3	29.7	8.2	7		16	
7-COC001.61	8/30/2006	S	0.3	29.1	8.2	6.9		18.6	
7-COC001.61	9/14/2006	S	0.3	23.2	7.3	**4.2**		17.6	
7-COC001.61	10/25/2006	S	0.3	13.8	7.7	8.9		16.9	
7-COC001.61	11/20/2006	S	0.3	12.5	7.9	10.3		16.6	
7-COC001.61	11/27/2006	S	0.3	10.4	8.1	11.8		11.2	
7-COC001.61	2/22/2007	S	0.3	5.4	7.6	14		13.1	
7-COC001.61	4/9/2007	S	0.3	12.4	8.4	10.8		12.6	
7-COC001.61	6/5/2007	S	0.3	25.3	8.1	8.7		13	
7-COC001.61	8/23/2007	S	0.3	26.7	7.9	7.2		16.6	
7-COC001.61	10/30/2007	S	0.3	17.1	7.5	7.8		19	
7-COC001.61	12/20/2007	S	0.3	6.7	8.2	11.1		20.1	
7-COC001.61	2/27/2008	S	0.3	7.1	8.2	5.3		16.8	
7-COC001.61	2/29/2008	S	0.3	6.3	7.3	11.7		16.1	
7-COC001.61	4/23/2008	S	0.3	17.7	8.3	8.6		12	
7-COC001.61	6/23/2008	S	0.3	26.6	8.1	6.9		11.8	
7-COC001.61	8/6/2008	S	0.3	29.3	8.2	5.1		14	
7-COC001.61	10/9/2008	S	0.3	20.7	8	7.1		17.4	
7-COC001.61	12/17/2008	S	0.3	7.3	8.1	11.4		18.8	
7-COC001.61	1/8/2009	S	0.3	5.8	7.9	10.7		18.2	
7-COC001.61	3/19/2009	S	0.3	9.1	8	11.1		16.5	
7-COC001.61	5/14/2009	S	0.3	20.5	8.4	8.7		12.7	
7-COC001.61	7/16/2009	S	0.3	27.7	8.5	8.5		14.9	
7-COC001.61	9/10/2009	S	0.3	23.4	7.4	5.1		15.5	
7-COC001.61	11/23/2009	S	0.3	13.2	7.7	9.1		15.3	
7-COC001.61	2/22/2010	S	0.3	6.2	7.5	12.5		11.6	
7-COC001.61	4/5/2010	S	0.3	17.1	8.2	11		10.6	
7-COC001.61	6/3/2010	S	0.3	28.3	8.1	11.2		11.9	
7-COC001.61	8/31/2010	S	0.3	29.2	7.9	6.8		15.8	
7-COC001.61	10/12/2010	S	0.3	20.7	7.7	8.3		18.1	
7-COC001.61	12/14/2010	S	0.3	3.3	7.5	11.9		18.7	
90th Percentile				**28.6**	**8.4**				
10th Percentile				**6.655**	**7.7**				
Mean								**16.2**	

Attachment 5 – 1979 VIMS Model for Cockrell Creek

F N C
Omega: Fact Sheet

State Water[illegible] [illegible]nt Board

4010 WEST [illegible] S[illegible] P. O. B[illegible] 1114[illegible] RICHMOND, VA.

SUBJECT: Menhaden Industries Permit Reissuance - Cockrell Creek Wasteload Allocation - Northumberland County

TO: File - Kilmarnock Office

FROM: G. T. Yagel

DATE: August 15, 1979

COPIES: L. S. McBride, L. G. Lawson, A. J. Anthony, J. R. Bell, F. K. Cunningha[illegible] Dale F. Jones, Burton R. Tuxford

In anticipation of this division's responsibilities for the reissuance of permits for two menhaden industries in Northumberland County, the issue of wasteload allocation for $CBOD_5$ has been under consideration for more than a year. The deadline date for the reissuance is January 1980. No attempt will be made to include in this memorandum a summary of all of the items brought forth in many conferences with VIMS, the permittee consultants, and other staff members. That information can be found in our regional office file. The purpose of this memorandum is to set forth conclusions reached during a conference with personnel of BAT, BWCM, BE, and TRO-DSP on August 7, 1979 at 10:30 a.m. Personnel involved are listed below:

A. J. Anthony	-	BAT
J. R. Bell	-	BAT
Dale F. Jones	-	BWCM
Burton R. Tuxford	-	BWCM
Anne Field	-	BE
G. T. Yagel	-	TRO-DSP

1. VIMS model of Cockrell Creek has been verified and will be utilized as the basis for wasteload allocation of the total loading from these menhaden industries during the drafting of limitations for reissued permits.

2. In accordance with the VIMS model, 5,000 pounds per day of carbonaceous BOD is the total limit allowable for all discharges into Cockrell Creek in order that 5.0 m/l of DO will be maintained in the upper layer of that receiving stream. 100 pounds per day of that total will be reserved for the Reedville Sanitary District sewage treatment facilities in order that growth may be allowed, leaving the industries with 4,900 pounds per day.

3. The 4,900 pounds total loading is considered a daily average and not a daily maximum.

4. The upper layer of Cockrell Creek, as identified in the VIMS model will be used to determine wasteload allocation which is agreed to by BWCM.

Omega Fact Sheet

5. Suspended Solids loading will be reduced in the reissued permits by the same proportion as the $CBOD_5$.

6. Net loading methodology used in the past for calculating daily loading from each industry will be deleted.

7. Alteration of the water quality standards now applicable to Cockrell Creek can only be accomplished in accordance with Section 35.1550 appearing in the Federal Register/Volume 44 No.101/Wednesday, May 23, 1979. It was Anne Field's opinion that relaxation of existing standards could be accomplished only if economic data, provided by each industry, demonstrated that compliance with wasteload allocations planned would necessitate termination of the operations of these industries.

8. After considering all alternatives for allocation methodology, it was decided that productivity capability of each industry would be used as the basis for determining the percentage of allowable loading of waste to be allocated to each industry during the drafting of permit limits for permit reissuance. TRO-DSP personnel will confer with the management of each industry on August 20, 1979 for the purpose of explaining the allocation methodology agreed upon in securing production capacity data.

9. In response to F. K. Cunningham and G. T. Yagel's memorandum to Dale Jones, dated August 6, 1979, comments from Dale Phillips regarding the approach planned for wasteload allocation and the use of the VIMS model are expected prior to August 20, 1979.

The writer is anticipating that at least one of these industries may be requesting a hearing before the Board after they receive notice of the allocation offered them, for the purpose of contesting our decision in accordance with the provisions of Regulation #6 and the current NPDES Permit Issuance Manual. During that hearing, economic data may be provided by each or both of these industries. That data probably should include dollar value of the final product exported from each of these plants to their markets, other socio-economic factors, which only the industries can provide, number of employees affected by possible termination of production, and production data for the 1973-1974 seasons as compared to that data available for the 1977-1978 production seasons.

/bj

Omega Fact Shee

HYDROGRAPHY AND HYDRODYNAMICS OF VIRGINIA ESTUARIES

IX. Mathematical Water Quality Study of Great Wicomico River and Cockrell Creek

by

P. V. Hyer
J. Jacobson

PREPARED UNDER

THE COOPERATIVE STATE AGENCIES PROGRAM

OF

THE VIRGINIA STATE WATER CONTROL BOARD AND
THE VIRGINIA INSTITUTE OF MARINE SCIENCE

Project Officers

Dale Jones
Michael Bellanca

Virginia State Water Control Board

Special Report No. 120
in Applied Marine Science and
Ocean Engineering

Virginia Institute of Marine Science
Gloucester Point, Virginia 23062

William J. Hargis, Jr.
Director

September 1976

Omega Fact Sheet

III. Description of Study Area

The drainage area of the Great Wicomico River takes in a portion of Northumberland County (see figure 1). This region is rural, with about half the land area covered by forest. Farming, commercial fishing and fish processing are the financial mainstays for the area.

Mean daily minimum temperatures are approximately thirty degrees and sixty-nine degrees Fahrenheit (minus one and twenty-one degrees Celsius) for January and July, respectively. The corresponding mean daily maximum temperatures are forty-eight degrees and eighty-eight degrees Fahrenheit respectively (nine and thirty-one degrees Celsius). Precipitation in the drainage basin exceeds forty-six inches (117 cm) per year. Autumn is drier than the rest of the year. Precipitation in the summer tends to occur as brief, heavy thundershowers, rather than as the more prolonged storms that occur throughout the rest of the year.

The Great Wicomico River empties directly into Chesapeake Bay. The land area of the drainage basin is only 70.6 square miles (182.8 km^2), resulting in relatively little freshwater inflow to the river. Tidal action is also weak, with the tidal current amplitude being on the order of 0.5 ft/sec (15 cm/sec) or less. Since the stream is short, there is very little time lag in the upstream propagation of the tidal wave.

Cockrell Creek is a tributary to the Great Wicomico. The creek empties into the river close to the river mouth. The creek has characteristics similar to the river; small drainage area (4.6 square miles, or 11.9 km^2) weak tidal action and low freshwater input. Two fish processing plants as well as the town of Reedville are located on Cockrell Creek. During the summer, the two plants introduce a total of about 5000 lb/day (2300 kg/day) of five-day carbonaceous BOD and about 900 lb/day (410 kg/day) of organic nitrogen and ammonia (as N).

Attachment 6 – Inspection Report

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
PIEDMONT REGIONAL OFFICE
4949-A Cox Road, Glen Allen, Virginia 23060
(804) 527-5020 Fax (804) 527-5106
www.deq.virginia.gov

L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

November 17, 2009

Mr. Robert La Bruzzo,
General Manager
Omega Protein, Inc.
PO Box 175
Reedville, VA 22539

Re: Wastewater Facility and Laboratory Inspections, VPDES Permit No. VA0003867 – Omega Protein, Inc.

Dear Mr. La Bruzzo,

Enclosed are the reports resulting from the subject inspections performed on November 5, 2009. Please review the reports carefully especially the **"General Recommendations" and "Compliance Recommendations" on page 5 of the Facility Inspection Report and the "Deficiencies" on page 3 of the Laboratory Inspection Report.**

Please provide a written response to the recommendations, citing corrective actions, within 30 days of receipt of this letter.

If you have questions regarding the reports, please contact me at (804) 527-5055.

Sincerely,

Mike Dare

Mike Dare
Water Inspector

Enclosure
CC: DEQ – File
T. Schultz - Omega
S. Stell
EPA

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Wastewater Facility Inspection Report

Facility Name:	Omega Protein, Inc.	**Facility No.:**	VA0003867
City/County:	Northumberland	**Inspection Agency:**	DEQ
Inspection Date:	November 5, 2009	**Date Form Completed:**	November 10, 2009
Inspector:	Mike Dare MD 11-10-09	**Time Spent:**	12 hrs. w/ travel & report
Reviewed By:	MRW 11/13/09 KW 11/16/09	**Unannounced Insp.?**	Yes
		FY-Scheduled Insp.?	Yes

Present at Inspection: Ted Schultz

TYPE OF FACILITY:

Domestic		Industrial	
[ ] Federal	[ ] Major	[x] Major	[ ] Primary
[ ] Non-Federal	[ ] Minor	[ ] Minor	[ ] Secondary

Population Served: approx.: (N/A)

Number of Connections: approx.: (N/A)

TYPE OF INSPECTION:

[x] Routine — Date of last inspection: August 5, 2008

[ ] Compliance — Agency: DEQ/PRO

[ ] Reinspection

EFFLUENT MONITORING: ***See Discharge Monitoring Reports (DMR) in file***

Last month average:	BOD: ___ mg/L	TSS: ___ mg/L	Flow: __ MGD
(Influent) Date:			
Other:			
Last month:	BOD: ___ mg/L	TSS: ___ mg/L	Flow:___ MGD
(Effluent) Date:			
Other:			
Quarter average:	BOD: ___ mg/L	TSS: ___ mg/L	Flow: ___ MGD
(Effluent) Date:			
Other:			

CHANGES AND/OR CONSTRUCTION

DATA VERIFIED IN PREFACE	[ ]Updated	[ ] No changes ***see below***
Has there been any new construction?	[x] Yes*	[ ] No
If yes, were plans and specifications approved?	[ ] Yes	[x] No* [ ] N/A
DEQ approval date:	***Lagoons discharge to new DAF and UV units.***	

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of licensed operators: Class I – 0, Class II – 0, Class III – 1, Class IV – 0, Trainee - 0
2. Hours per day plant is staffed: WWTF: on site 4 hrs; monitored via computer 24/7
3. Describe adequacy of staffing: [ ] Good [x] Average [ ] Poor*
4. Does the plant have an established program for training personnel? [x] Yes [ ] No
5. Describe the adequacy of the training program: [ ] Good [x] Average [ ] Poor*
6. Are preventive maintenance tasks scheduled? [x] Yes [ ] No*
7. Describe the adequacy of maintenance: [ ] Good [x] Average [ ] Poor*
8. Does the plant experience any organic/hydraulic overloading? [ ] Yes* [x] No

   If yes, identify cause and impact on plant: N/A
9. Any bypassing since last inspection? [x] Yes* [ ] No
10. Is the on-site electric generator operational? [x] Yes [ ] No* [ ] N/A
11. Is the STP alarm system operational? [ ] Yes [ ] No * [x] N/A
12. How often is the standby generator exercised? [x] Weekly [ ] Monthly [ ] Other: N/A

    Power Transfer Switch? [x] Weekly [ ] Monthly [ ] Other: N/A

    Alarm System? [ ] Weekly [ ] Monthly [x] Other: N/A
13. When were the cross connection control devices last tested on the potable water service? 2 units last tested 4/09
14. Is sludge disposed in accordance with the approved sludge disposal plan? [x] Yes [ ] No* [ ] N/A
15. Is septage received by the facility? [ ] Yes [x] No

    Is septage loading controlled? [ ] Yes [ ] No * [x] N/A

    Are records maintained? [ ] Yes [ ] No* [x] N/A
16. Overall appearance of facility: [ ] Good [x] Average [ ] Poor*

Comments: #4 Training consists of on-the-job training. #14 – It is noted that the sludge holding lagoon is nearing capacity.

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?

Operational Logs for each unit process	[x] Yes	[ ] No*	[ ] N/A
Instrument maintenance and calibration	[x] Yes	[ ] No*	[ ] N/A
Mechanical equipment maintenance	[x] Yes	[ ] No*	[ ] N/A
Industrial waste contribution **(Municipal Facilities)**	[ ] Yes	[ ] No*	[x] N/A

2. What does the operational log contain?

Visual Observations	[ ] Yes	[x] No	[ ] N/A
Flow Measurement	[x] Yes	[ ] No	[ ] N/A
Laboratory Results	[x] Yes	[ ] No	[ ] N/A
Process Adjustments	[x] Yes	[ ] No*	[ ] N/A
Control Calculations	[ ] Yes	[ ] No	[x] N/A
Other:	N/A		

3. What do the mechanical equipment records contain:

As built plans and specs?	[x] Yes	[ ] No*	[ ] N/A
Spare parts inventory?	[x] Yes	[ ] No*	[ ] N/A
Manufacturers instructions?	[x] Yes	[ ] No*	[ ] N/A
Equipment/parts suppliers?	[x] Yes	[ ] No*	[ ] N/A
Lubrication schedules?	[x] Yes	[ ] No*	[ ] N/A
Other:	N/A		
Comments:	None		

4. What do the industrial waste contribution records contain: ***(Applicable to municipal facilities only)***

Waste characteristics?	[ ] Yes	[ ] No*	[x] N/A
Locations and discharge types?	[ ] Yes	[ ] No*	[x] N/A
Impact on plant?	[ ] Yes	[ ] No*	[x] N/A
Other:	N/A		
Comments:	None		

5. Are the following records maintained at the plant:

Equipment maintenance records	[x] Yes	[ ] No*	[ ] N/A
Operational Log	[x] Yes	[ ] No*	[ ] N/A
Industrial contributor records	[ ] Yes	[ ] No*	[x] N/A
Instrumentation records	[x] Yes	[ ] No*	[ ] N/A
Sampling and testing records	[x] Yes	[ ] No*	[ ] N/A

6. Are records maintained at a different location? [ ] Yes [x] No
   Where are the records maintained? All are available on site.

7. Were the records reviewed during the inspection [ ] Yes [x] No

8. Are the records adequate and the O & M Manual current? [ ] Yes [ ] No* [ ] N/A Not reviewed
   O&M Manual date written: July 27, 1998 with subsequent updates
   Date DEQ approved O&M: April 6, 2006

9. Are the records maintained for required 3-year period? [x] Yes [ ] No*

Comments: A process control system has been installed. Plant records are maintained either electronically or by hand.

(C) SAMPLING

1.	Are sampling locations capable of providing representative samples?	[x] Yes	[ ] No*	[ ] N/A
2.	Do sample types correspond to those required by the permit?	[x] Yes	[ ] No*	[ ] N/A
3.	Do sampling frequencies correspond to those required by the permit?	[x] Yes	[ ] No*	[ ] N/A
4.	Are composite samples collected in proportion to flow?	[x] Yes	[ ] No*	[ ] N/A
5.	Are composite samples refrigerated during collection?	[x] Yes	[ ] No*	[ ] N/A
6.	Does plant maintain required records of sampling?	[x] Yes	[ ] No*	[ ] N/A
7.	Does plant run operational control tests?	[x] Yes	[ ] No*	[ ] N/A

Comments:

(D) TESTING

1. Who performs the testing?
   [x] Plant/ Lab
   [ ] Central Lab
   [x] Commercial Lab - Name: **Air, Water & Soil and CBI Laboratories**

If plant performs any testing, complete 2-4.

2.	What method is used for chlorine analysis?	N/A		
3.	Is sufficient equipment available to perform required tests?	[x] Yes	[ ] No*	[ ] N/A
4.	Does testing equipment appear to be clean and/or operable?	[x] Yes	[ ] No*	[ ] N/A

Comments: Please see enclosed DEQ *Laboratory Inspection Report.*

(E) FOR INDUSTRIAL FACILITIES W/ TECHNOLOGY BASED LIMITS

1. Is the production process as described in the permit application? (If no, describe changes in comments)
   [x] Yes [ ] No* [ ] N/A
2. Do products and production rates correspond to the permit application? (If no, list differences in comments section)
   [x] Yes [ ] No* [ ] N/A
3. Has the State been notified of the changes and their impact on plant effluent?
   [ ] Yes [ ] No* [x] N/A

Comments: None

FOLLOW UP TO COMPLIANCE RECOMMENDATIONS FROM THE AUGUST 5, 2008 DEQ INSPECTION:

1. There were no compliance recommendations from the August 5, 2008 DEQ inspection.

FOLLOW UP TO GENERAL RECOMMENDATIONS FROM THE AUGUST 5, 2008 DEQ INSPECTION:

1. There were no general recommendations from the August 5, 2008 DEQ inspection.

INSPECTION REPORT SUMMARY

Compliance Recommendations/Request for Corrective Action:

1. A Certificate to Operate (CTO) must be obtained for the newly installed DAF and UV units. Contact Ms. Denise Mosca at this office if further instruction is required.

2. Ensure that at least a 1 foot freeboard is maintained when solids from the DAF unit are applied to the sludge holding lagoon. (Dried solids were noted at the time of inspection above the one foot freeboard line.)

General Recommendations/Observations:

1. The sludge holding lagoon reportedly may be at capacity by the end of 2010. A plan should be developed **now** for the handling of solids produced at the facility once the lagoon reaches capacity.

Comments:

Omega Protein, Inc. is a producer of fish oil and fish meal. The oils are stored in above ground storage tanks which are protected by spill containment dikes. Containment areas also protect fuel oil and diesel above ground storage tanks. Best Management Practices (BMP) compliance reports are submitted along with the Discharge Monitoring Report (DMR). Swift Creek Environmental performs ground water monitoring. Vessel repair work is performed by contractor at an off site location. The flame dryer and associated air scrubber have been removed from service. This action has allowed for the elimination of any discharge from outfall 001, which included a potential cyanide component. Fish processing is now performed utilizing existing steam driers in conjunction with a new airless dryer. Lagoons discharge to new DAF and UV units, installed to meet permit compliance schedules for total phosphorus, fecal coliform and enterococci at outfall 002.

Areas of emphasis (Compliance Assessment) – check all that apply:

[x] Yes	[ ] No		Operational Units
[ ] Yes	[x] No		Evaluation of O & M Manual
[ ] Yes	[x] No		Maintenance Records
[ ] Yes	[ ] No	[x] N/A	Pathogen Reduction & Vector Attraction Reduction
[x] Yes	[ ] No	[ ] N/A	Sludge Disposal Plan
[x] Yes	[ ] No	[ ] N/A	Groundwater Monitoring Plan
[ ] Yes	[x] No	[ ] N/A	Storm Water Pollution Prevention Plan (See SWPPP Reports)
[x] Yes	[ ] No	[ ] N/A	Permit Special Conditions
[ ] Yes	[x] No	[ ] N/A	Permit Water Quality Chemical Monitoring
[x] Yes	[ ] No	[ ] N/A	Laboratory Records (see Lab Report)

UNIT PROCESS: Ponds/Lagoons

1.	Type:	[x] Aerated	[ ] Unaerated	[ ] Polishing	
2.	No. of cells: Number in Operation:	2 2			
3.	Color:	[ ] Green [x] Other	[ ] D. Brown ***clear to light green***	[ ] L. Brown	[ ] Grey
4.	Odor:	[ ] Septic * [ ] Other:	[ ] Earthy	[x] None	
5.	System operated in:	[x] Series	[ ] Parallel	[ ] N/A	
6.	If aerated, are lagoon contents mixed adequately?	[x] Yes	[ ] No *	[ ] N/A	
7.	If aerated, is aeration system operating properly?	[x] Yes	[ ] No *	[ ] N/A	
8.	Evidence of following problems:				
	a. Vegetation in lagoon or dikes?	[ ] Yes *	[x] No		
	b. Rodents burrowing on dikes?	[ ] Yes *	[x] No		
	c. Erosion?	[ ] Yes *	[x] No		
	d. Sludge bars?	[ ] Yes *	[x] No		
	e. Excessive foam?	[ ] Yes *	[x] No		
	f. Floating material?	[ ] Yes *	[x] No		
9.	Fencing intact?	[x] Yes	[ ] No *		
10.	Grass maintained properly:	[x] Yes	[ ] No		
11.	Level control valves working properly?	[x] Yes	[ ] No *	[ ] N/A	
12.	Effluent discharge elevation:	[x] Top	[ ] Middle	[ ] Bottom	
13.	Available freeboard:	approx. 3 ft.			
14.	Appearance of effluent:	[ ] Good	[ ] Fair	[ ] Poor * ***N/A***	
15.	Are monitoring wells present?	[x] Yes	[ ] No		
	Are wells adequately protected from runoff?	[x] Yes	[ ] No *	[ ] N/A	
	Are caps on and secured?	[x] Yes	[ ] No *	[ ] N/A	
16.	General condition:	[x] Good	[ ] Fair	[ ] Poor*	

Comments: The two aerated lagoons operate in series and receive condensate water from the evaporators. The plant evaporators are occasionally cleaned with H_2SO_4 or HNO_3. This cleaning solution is placed in a tank and metered into the lagoon system. Each lagoon has a curtain to improve biological treatment and extend retention time. Nitrifying bacteria (Nitrobacter and Nitrosomonas) are added near the influent to the first lagoon. A backup generator allows aeration to continue during power outages. #9 – A couple of gaps, used for lagoon access, noted in perimeter fencing.

UNIT PROCESS: Sludge Holding Lagoon

1.	Type:	[ ] Aerated	[x] Unaerated	[ ] Polishing	
2.	No. of cells: Number in Operation:	1 1			
3.	Color:	[x] Green [ ] Other	[ ] D. Brown	[ ] L. Brown	[ ] Grey
4.	Odor:	[ ] Septic * [ ] Other:	[ ] Earthy	[x] None	
5.	System operated in:	[ ] Series	[ ] Parallel	[x] N/A	
6.	If aerated, are lagoon contents mixed adequately?	[ ] Yes	[ ] No *	[x] N/A	
7.	If aerated, is aeration system operating properly?	[ ] Yes	[ ] No *	[x] N/A	
8.	Evidence of following problems:				
	a. Vegetation in lagoon or dikes?	[ ] Yes *	[x] No		
	b. Rodents burrowing on dikes?	[ ] Yes *	[x] No		
	c. Erosion?	[ ] Yes *	[x] No		
	d. Sludge bars?	[x] Yes *	[ ] No		
	e. Excessive foam?	[ ] Yes *	[x] No		
	f. Floating material?	[ ] Yes *	[x] No		
9.	Fencing intact?	[ ] Yes	[ ] No *	***Not fenced***	
10.	Grass maintained properly:	[x] Yes	[ ] No		
11.	Level control valves working properly?	[ ] Yes	[ ] No *	[x] N/A	
12.	Effluent discharge elevation:	[ ] Top	[ ] Middle	[ ] Bottom	[x] N/A
13.	Available freeboard:	approx. 2 ft.			
14.	Appearance of effluent:	[ ] Good	[ ] Fair	[ ] Poor *	[x] N/A
15.	Are monitoring wells present?	[x] Yes	[ ] No		
	Are wells adequately protected from runoff?	[x] Yes	[ ] No *	[ ] N/A	
	Are caps on and secured?	[x] Yes	[ ] No *	[ ] N/A	
16.	General condition:	[ ] Good	[ ] Fair	[x] Poor*	

Comments: Though sludge from the aerated lagoons has not been added to this sludge holding lagoon since approximately January 2006 solids from a recently installed DAF unit have been added. There is a sludge bar (from previous aerated lagoon sludge additions) visible at the center. Dried solids were noted at the time of inspection above the one foot freeboard line.

UNIT PROCESS: Flow Measurement

Outfall 002

[ ] Influent [ ] Intermediate [x] Effluent

1.	Type measuring device:	90° v-notch weir w/ultrasonic sensor		
2.	Present reading:	Not obtained		
3.	Bypass channel?	[ ] Yes	[x] No	
	Metered?	[ ] Yes	[ ] No*	[x] N/A
4.	Return flows discharged upstream from meter?	[ ] Yes	[x] No	
	If Yes, identify:			
5.	Device operating properly?	[x] Yes	[ ] No*	
6.	Date of last calibration:	4/28/09		
7.	Evidence of following problems:			
	a. Obstructions?	[ ] Yes*	[x] No	
	b. Grease?	[ ] Yes*	[x] No	
8.	General condition:	[x] Good	[ ] Fair	[ ] Poor*

Comments: Effluent from the aerated lagoons flows through new DAF and UV units before discharging to outfall 002. The automatic sampler at this location is tied into the flow meter for flow proportional sampling. At the time of inspection, the discharge at outfall 002 was clear with a small number of tiny flecks of solids (probably algae). Sampling of O/F 002 by M. Dare at 1140 hrs. – pH: 6.22 SU, 16.7 deg C.

UNIT PROCESS: Flow Measurement

Outfall 995

		[ ] Influent	**[ ] Intermediate**	**[x] Effluent**	
1.	Type measuring device:		None		
2.	Present reading:		Based on pump run times		
3.	Bypass channel?		[ ] Yes	[x] No	
	Metered?		[ ] Yes	[ ] No*	[x] N/A
4.	Return flows discharged upstream from meter?		[ ] Yes	[x] No	
	If Yes, identify:		N/A		
5.	Device operating properly?		[ ] Yes	[ ] No*	[x] N/A
6.	Date of last calibration:		N/A		
7.	Evidence of following problems:				
	a. Obstructions?		[ ] Yes*	[x] No	
	b. Grease?		[ ] Yes*	[x] No	
8.	General condition:		[x] Good	[ ] Fair	[ ] Poor*

Comments: Non-contact cooling water discharges through this outfall. There was no discharge from outfall 995 at the time of inspection.

UNIT PROCESS: Flow Measurement

Outfall 001

[ ] Influent [ ] Intermediate [ ] Effluent

1.	Type measuring device:			
2.	Present reading:			
3.	Bypass channel?	[ ] Yes	[ ] No	
	Metered?	[ ] Yes	[ ] No*	[ ] N/A
4.	Return flows discharged upstream from meter?	[ ] Yes	[ ] No	
	If Yes, identify:			
5.	Device operating properly?	[ ] Yes	[ ] No*	[ ] N/A
6.	Date of last calibration:			
7.	Evidence of following problems:			
	a. Obstructions?	[ ] Yes*	[ ] No	
	b. Grease?	[ ] Yes*	[ ] No	
8.	General condition:	[ ] Good	[ ] Fair	[ ] Poor*

Comments: The flame dryer and associated air scrubber have been removed from service. This action has allowed for the elimination of any discharge from outfall 001, which included a potential cyanide component. Fish processing is now performed utilizing existing steam driers in conjunction with a new airless dryer.

UNIT PROCESS: Effluent/Plant Outfall

1. Type outfall: [x] Shore based (995) [x] Submerged (002)

2. Type if shore based: [ ] Wingwall [x] Headwall [ ] Rip Rap [ ] N/A

3. Flapper valve? [ ] Yes [x] No

4. Erosion of bank? [ ] Yes* [x] No [ ] N/A

5. Effluent plume visible? [ ] Yes * [x] No

Comments: None

6. Condition of outfall and supporting structures: [x] Good [ ] Fair [ ] Poor *

7. Final effluent, evidence of following problems:

   a. Oil sheen? [ ] Yes* [x] No

   b. Grease? [ ] Yes* [x] No

   c. Sludge bar? [ ] Yes* [x] No

   d. Turbid effluent? [ ] Yes* [x] No

   e. Visible foam? [ ] Yes* [x] No

   f. Unusual odor? [ ] Yes* [x] No

Comments: At the time of inspection, the discharge at outfall 002 was clear with a small number of tiny flecks of solids (probably algae); there was no discharge from outfall 995. (Sampling of O/F 002 by M. Dare at 1140 hrs. – pH: 6.22 SU, 16.7 deg C.) Bailwater (water used to remove fish from ship holds) is hauled by ship and discharged in the Atlantic Ocean. Refrigeration water is discharged in the Bay according to Permit requirements.

cc:

[x] Owner: c/o Mr. Robert La Bruzzo - General Manager

[x] Operator: Ted Schultz

[ ] Local Health Department:

[ ] VDH Engineering Field Office: Field Office

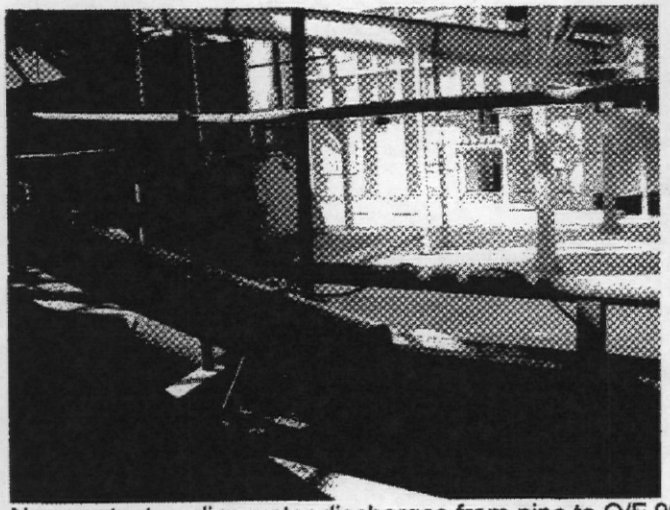
[ ] VDH/Central Office - DWE

[x] DEQ - OWCP

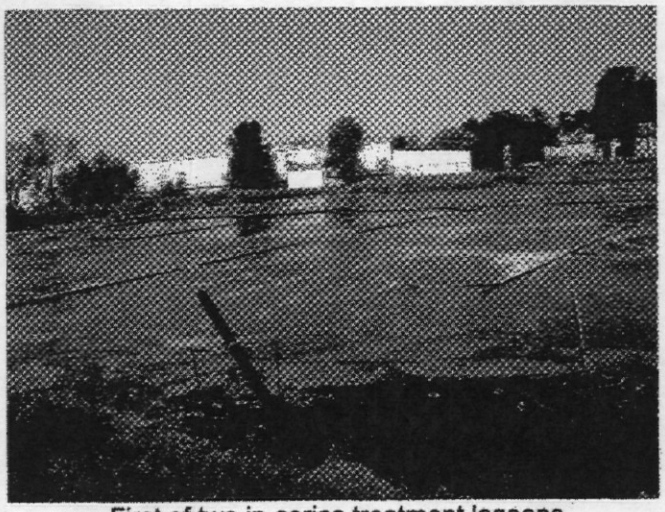
[x] DEQ - Regional Office File

[x] EPA - Region III

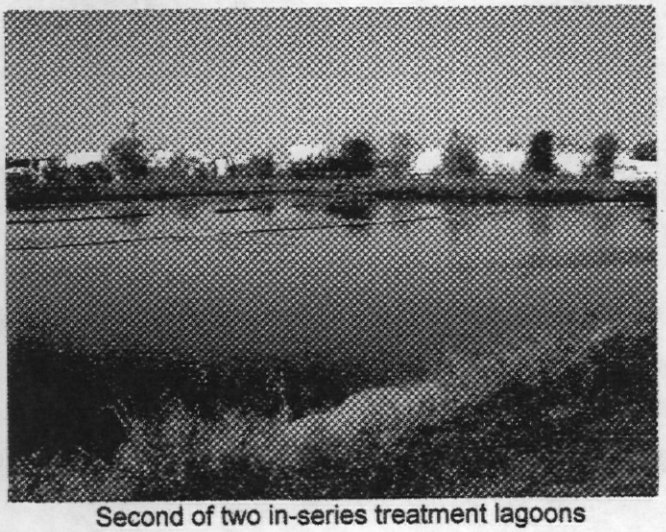
INSPECTION PHOTOS



Non-contact cooling water discharges from pipe to O/F 995

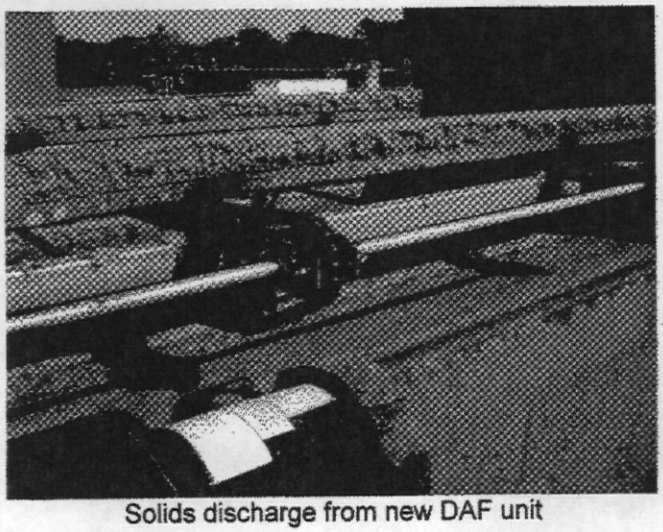


First of two in-series treatment lagoons

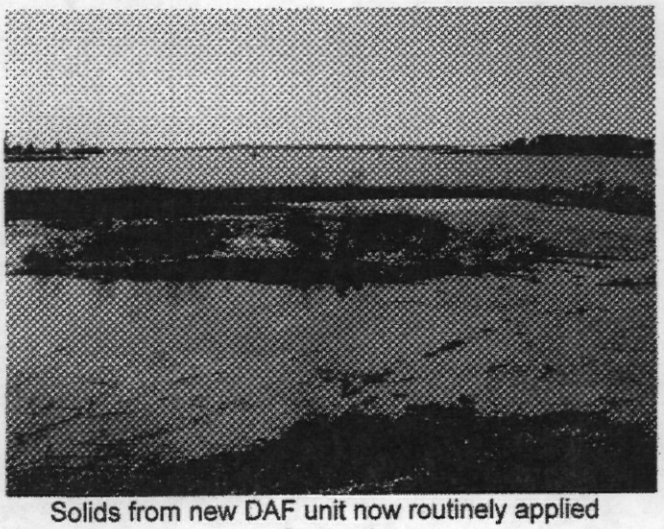


Second of two in-series treatment lagoons

Lagoon effluent flows through new DAF and UV units before discharging to outfall 002. Photo is of discharge from new DAF unit.



Solids discharge from new DAF unit



Solids from new DAF unit now routinely applied to Sludge lagoon

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
LABORATORY INSPECTION REPORT

Form Updated 10/4/2001

FACILITY NO:	INSPECTION DATE:	PREVIOUS INSP. DATE:	PREVIOUS EVALUATION:	TIME SPENT:
VA0003867	November 5, 2009	August 5, 2008	(x) Deficiencies ( ) No Deficiencies	12 hours w/ travel & report

NAME/ADDRESS OF FACILITY:	FACILITY CLASS:	FACILITY TYPE:	UNANNOUNCED INSPECTION?	FY-SCHEDULED INSPECTION?
Omega Protein, Inc. PO Box 175 Reedville, VA 22539	(x) MAJOR ( ) MINOR ( ) SMALL ( ) VPA/NDC	( ) MUNICIPAL (x) INDUSTRIAL ( ) FEDERAL ( ) COMMERCIAL LAB	(x) YES ( ) NO	(x) YES ( ) NO

INSPECTOR(S):	REVIEWERS:	PRESENT AT INSPECTION:
Mike Dare MDare 11-10-09	MRW 11/13/09 Kw 11/16/09	Ted Schultz

LABORATORY EVALUATION	DEFICIENCIES? Yes	No
LABORATORY RECORDS	X	
GENERAL SAMPLING & ANALYSIS		X
LABORATORY EQUIPMENT	X	
pH ANALYSIS PROCEDURES		X

QUALITY ASSURANCE/QUALITY CONTROL

Y/N	QUALITY ASSURANCE METHOD	PARAMETERS	FREQUENCY
N	REPLICATE SAMPLES		
N	SPIKED SAMPLES		
Y	STANDARD SAMPLES	pH	Daily
N	SPLIT SAMPLES		
N	SAMPLE BLANKS		
	OTHER		
	EPA-DMR PE SAMPLES?	RATING: ( ) No Deficiency ( ) Deficiency (X) NA	
	QC SAMPLES PROVIDED?	RATING: ( ) No Deficiency ( ) Deficiency (X) NA	

COPIES TO: (X) DEQ - RO; (X) OWCP; ( ) VDH- FO and DWE; (X) OWNER; (X) EPA-Region III; (X) Other: Ted Schultz

FACILITY #: VA0003867

LABORATORY RECORDS SECTION

LABORATORY RECORDS INCLUDE THE FOLLOWING:

X	SAMPLING DATE	X	ANALYSIS DATE	N/A	CONT MONITORING CHART
X	SAMPLING TIME	X	ANALYSIS TIME	X	INSTRUMENT CALIBRATION
X	SAMPLE LOCATION	X	TEST METHOD	X	INSTRUMENT MAINTENANCE
				X	CERTIFICATE OF ANALYSIS

WRITTEN INSTRUCTIONS INCLUDE THE FOLLOWING:

X	SAMPLING SCHEDULES	X	CALCULATIONS	X	ANALYSIS PROCEDURES

	YES	NO	N/A
DO ALL ANALYSTS INITIAL THEIR WORK?	X		
DO BENCH SHEETS INCLUDE ALL INFORMATION NECESSARY TO DETERMINE RESULTS?	X		
IS THE DMR COMPLETE AND CORRECT? MONTH(S) REVIEWED: ***VA0003867 and VAN020037 - September 2009***		X	
ARE ALL MONITORING VALUES REQUIRED BY THE PERMIT REPORTED?	X		

GENERAL SAMPLING AND ANALYSIS SECTION

	YES	NO	N/A
ARE SAMPLE LOCATION(S) ACCORDING TO PERMIT REQUIREMENTS?	X		
ARE SAMPLE COLLECTION PROCEDURES APPROPRIATE?	X		
IS SAMPLE EQUIPMENT CONDITION ADEQUATE?	X		
IS FLOW MEASUREMENT ACCORDING TO PERMIT REQUIREMENTS?	X		
ARE COMPOSITE SAMPLES REPRESENTATIVE OF FLOW?	X		
ARE SAMPLE HOLDING TIMES AND PRESERVATION ADEQUATE?	X		
IF ANALYSIS IS PERFORMED AT ANOTHER LOCATION, ARE SHIPPING PROCEDURES ADEQUATE? LIST PARAMETERS AND NAME & ADDRESS OF LAB: **Air, Water and Soil, Labortories, Inc., Richmond, VA - *BOD*, *TSS*, *TKN*, *NH3*, *NO2/NO3*, *NO3*, Total N, Ortho & Total P, Oil & Grease, Cyanide, Fecal Coliform, Enterococci, TOC, Copper, Silver, Zinc, Aluminum; CBI Laboratories, Gloucester, VA – Toxicity testing.**	X		

LABORATORY EQUIPMENT SECTION

	YES	NO	N/A
IS LABORATORY EQUIPMENT IN PROPER OPERATING RANGE?	X		
ARE ANNUAL THERMOMETER CALIBRATION(S) ADEQUATE?		X	
IS THE LABORATORY GRADE WATER SUPPLY ADEQUATE?			X
ARE ANALYTICAL BALANCE(S) ADEQUATE?			X

LABORATORY INSPECTION REPORT SUMMARY

FACILITY NAME:	FACILITY NO:	INSPECTION DATE:
Omega Protein, Inc.	VA0003867	November 5, 2009
OVERALL LABORATORY EVALUATION:	**(x) Deficiencies** **( ) No Deficiencies**	

LABORATORY RECORDS

VA0003867, September 2009 DMR for outfall 002

When calculating BOD, use "0" in calculations for values <QL (5 mg/L).
When calculating the geomean for fecal coliform, use 1 for values that are <1.
When calculating total phosphorus, use "0" in calculations for values <QL (0.1 mg/L).
There is no QL for oil and grease. Report laboratory results on DMR.

VA0003867, September 2009 DMR for outfall 995

The QL for total copper is 7.4 ug/L. Report values less than this as "<QL."
The QL for dissolved zinc is 72 ug/L. Report values less than this as "<QL."

Because the above issues are minor, a resubmittal of the DMR's is not required.

VAN020037, September 2009 DMR for outfall 501

The QL is the lowest standard in the calibration curve for a given analyte. If a value is <QL, use ½ the QL in calculations. Express concentration to the nearest 0.01 mg/L. Use 8.3438 lbs/gal as conversion factor. Express flow to nearest 0.01 MGD. Round daily loads to nearest whole number.

VAN020037, September 2009 DMR for outfall 502

The QL is the lowest standard in the calibration curve for a given analyte. If a value is <QL, use ½ the QL in calculations. Express concentration to the nearest 0.01 mg/L. Use 8.3438 lbs/gal as conversion factor. Express flow to nearest 0.01 MGD. Round daily loads to nearest whole number except if zero; in which case it is recommended that daily loads are left as is and then rounded for monthly load.

1. Using Nutrient General Permit Guidelines, please recalculate and resubmit Nutrient General DMR's for 2009, for outfalls 501, 502 and 500 (total of outfalls 501 & 502).

GENERAL SAMPLING AND ANALYSIS

None

LABORATORY EQUIPMENT

1. Begin maintaining a daily log of sample refrigerator and auto sampler temperatures.

INDIVIDUAL PARAMETERS

None

COMMENTS

None

ANALYST:	Ted Schultz	VPDES NO	VA0003867

Meter: Symphony VWR

Parameter: Hydrogen Ion (pH)
1/08

Method: Electrometric

METHOD OF ANALYSIS:

X	18th Edition of Standard Methods – 4500-H^+ B
	21st or Online Editions of Standard Methods – 4500-H^+ B (00)

	pH is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]	**Y**	**N**
1)	Is a certificate of operator competence or initial demonstration of capability available for each analyst/operator performing this analysis? **NOTE**: Analyze 4 samples of known pH. May use external source of buffer (different lot/manufacturer than buffers used to calibrate meter). Recovery for each of the 4 samples must be +/- 0.1 SU of the known concentration of the sample. [SM 1020 B.1]	X	
2)	Is the electrode in good condition (no chloride precipitate, scratches, deterioration, etc.)? [2.b/c and 5.b]	X	
3)	Is electrode storage solution in accordance with manufacturer's instructions? [Mfr.]	X	
4)	Is meter calibrated on at least a daily basis using three buffers all of which are at the same temperature? [4.a] **NOTE**: Follow manufacturer's instructions.	X	
5)	After calibration, is a buffer analyzed as a check sample to verify that calibration is correct? Agreement should be within +/- 0.1 SU. [4.a]	X	
6)	Do the buffer solutions appear to be free of contamination or growths? [3.1]	X	
7)	Are buffer solutions within the listed shelf-life or have they been prepared within the last 4 weeks? [3.a]	X	
8)	Is the cap or sleeve covering the access hole on the reference electrode removed when measuring pH? [Mfr.] GEL	N/A	
9)	For meters with ATC that also have temperature display, is the thermometer verified annually? [SM 2550 B.1]	X	
10)	Is temperature of buffer solutions and samples recorded when determining pH? [4.a]	X	
11)	Is sample analyzed within 15 minutes of collections? [40 CFR Part 136]	In-situ	
12)	Is the electrode rinsed and then blotted dry between reading solutions (Disregard if a portion of the next sample analyzed is used as the rinsing solution.)? [4.a]	X	
13)	Is the sample stirred gently at a constant speed during measurement? [4.b]	In-situ	
14)	Does the meter hold a steady reading after reaching equilibrium? [4.b]	X	
15)	Is a duplicate sample analyzed after every 20 samples if citing 18th or 19th Edition or daily for 20th or 21st Edition? [Part 1020] **NOTE**: Not required for *in situ* samples.	N/A	
16)	Is the pH of duplicate samples within 0.1SU of the original sample? [Part 1020]	N/A	
17)	Is there a written procedure for which result will be reported on DMR (Sample or Duplicate) and is this procedure followed? [DEQ]	N/A	

PROBLEMS: None

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
SAMPLE ANALYSIS HOLDING TIME/CONTAINER/PRESERVATION CHECK SHEET
Revised 3/08 [40 CFR, Part 136.3, Table II]

FACILITY NAME:	**Omega Protein, Inc.**	VPDES NO	**VA0003867**	DATE:	**November 5, 2009**

HOLDING TIMES						SAMPLE CONTAINER				PRESERVATION				
PARAMETER	APPROVED	MET?		LOGGED?		ADEQ. VOLUME		APPROP. TYPE		APPROVED	MET?		CHECKED?	
		Y	N	Y	N	Y	N	Y	N		Y	N	Y	N
BOD5 & CBOD5	48 HOURS	X		X		X		X		ANALYZE 2 HRS *or* 6°C	X		X	
TSS	7 DAYS	X		X		X		X		6°C	X		X	
FECAL COLIFORM / *E. coli / Enterococci*	6 HRS & 2 HRS TO PROCESS	X		X		X		X		10°C (1 HOUR)+ 0.008% $Na_2S_2O_3$	X		X	
pH	15 MIN.	X		X		X		X		N/A				
CHLORINE	15 MIN.									N/A				
DISSOLVED 0_2	15 MIN./IN SITU									N/A				
TEMPERATURE	IMMERSION STAB.									N/A				
OIL & GREASE	28 DAYS	X		X		X		X		6°C + H_2SO_4/HCL pH<2	X		X	
AMMONIA	28 DAYS	X		X		X		X		6°C + H_2S0_4 pH<2 DECHLOR	X		X	
TKN	28 DAYS	X		X		X		X		6°C + H_2S0_4 pH<2 DECHLOR	X		X	
NITRATE	48 HOURS									6°C				
NITRATE+NITRITE	28 DAYS	X		X		X		X		6°C + H_2S0_4 pH<2	X		X	
NITRITE	48 HOURS	X		X		X		X		6°C	X		X	
PHOSPHATE, ORTHO	48 HOURS	X		X		X		X		FILTER, 6°C	X		X	
TOTAL PHOS.	28 DAYS	X		X		X		X		6°C+ H_2S0_4 pH<2	X		X	
METALS (except Hg)	6 MONTHS	X		X		X		X		HNO_3 pH<2	X		X	
MERCURY (CVAA)	28 DAYS									HNO_3 pH<2				
PROBLEMS: None										PROBLEMS: None				

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
EQUIPMENT TEMPERATURE LOG/THERMOMETER VERIFICATION CHECK SHEET
1/08

FACILITY NAME:	Omega Protein, Inc.	VPDES NO:	VA0003867	DATE:	November 5, 2009

EQUIPMENT	RANGE	IN RANGE		INSPECT READING °C	CHECK & LOG DAILY		CORRECT INCREMENT		ANNUAL THERMOMETER VERIFICATION				
									Is the NIST / NIST-Traceable Reference Thermometer within the manufacturer's expiration date or recertified yearly?				Y
									DATE CHECKED	MARKED		CORR FACTOR	INSPECT TEMP
		Y	N		Y	N	Y	N		Y	N	°C	°C
SAMPLE REFRIGER.	1-6°C	X		0.9 °C		X	X		8/19/09	X		-0.2°C	
AUTO SAMPLER	1-6° C	X		002 – 3.0°C		X	X		8/19/09	X		0°C	
BOD INCUBATOR	20 ± 1° C												
SOLIDS DRYING OVEN	103-105° C												
WATER BATH	44.5 ± .2° C												
INCUBATOR	35± .5° C												
AUTOCLAVE	121° C IN 30 MIN												
HOT AIR STERILIZING	170 ± 10° C												
O & G WATER BATH	70± 2° C												
REAGENT REFRIGER.	1-6° C												
pH METER	± 1° C								8/18/09	X		+0.1°C	
DO METER	± 1° C												
THERMOMETER-OUTFALL	± 1° C												
Hg WATER BATH	95 ° C												

Comments: Outfall 995 currently composited manually.
Problems: Need to maintain daily log of sample refrigerator and auto sampler temperatures.

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

DEPT. OF
(I

ERMITTEE NAME/ADDRESS (INCLUDE
CILTY NAME/LOCATION IF DIFFERENT)

Piedmont Re
4949-A Cox

Glen Allen,

ME	Omega Protein - Reedville
DDRESS	PO Box 175
	Reedville, VA 22539
CILITY	
OCATION	610 Menhaden Rd

13.5 of 14

VA0003867	002
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	2009	09	01	TO	2009	09	30

NOTE: REA
BEF

Parameter		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE	LAB CODE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS				
OW	REPORTD	0.161	0.258	MGD	*****	*****	*****		0	CONT	MEAS	
RAM CODE: 001	REQRMNT	NL	NL		*****	*****	*****			CONT	MEAS	
I	REPORTD	*****	*****		6.12	*****	7.97	SU	0	2D/W	GRAB	
RAM CODE: 002	REQRMNT	*****	*****		6.0	*****	9.0			2D/W	GRAB	
OD5	REPORTD	14.5	26.9	KG/D	*****	*****	*****		0	2/M	24HC	
RAM CODE: 003	REQRMNT	470	840		*****	*****	*****			2/M	24HC	
S	REPORTD	2.2	2.7	KG/D	*****	*****	*****		0	2/M	24HC	
RAM CODE: 004	REQRMNT	160	410		*****	*****	*****			2/M	24HC	
OLIFORM, FECAL	REPORTD	*****	*****		*****	4	*****	N/CML	0	1/W	GRAB	
RAM CODE: 006	REQRMNT	*****	*****		*****	NL	*****			1/W	GRAB	
OSPHORUS,	REPORTD	0.05 .02	*****	KG/D	*****	0.00 .04	*****	MG/L	0	1/W	24HC	
OTAL (AS P)	REQRMNT	1.9	*****		*****	2.0	*****			1/W	24HC	
MMONIA, AS N	REPORTD	*****	*****		*****	14.1	15.6	MG/L	0	2/M	24HC	
RAM CODE: 039	REQRMNT	*****	*****		*****	38	45			2/M	24HC	

NERAL PERMIT REQUIREMENTS OR COMMENTS:
RAMETER-SPECIFIC COMMENTS:

YPASSES AND VERFLOWS	TOTAL OCCURENCES	TOTAL FLOW (M.G.)	TOTAL BOD5 (K.G.)	OPERATOR IN RESPONSIBLE CHARGE	
	0	0	0	Theodore Schultz	1911004868

RTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL TACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED SONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION MITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO NAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR THERING THE INFORMATION, THE INFORMATION SUBMITTED IS TO THE T OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE AND COMPLETE. I AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING SE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND RISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. & 1001 AND 33 C. & 1319. (Penalties under these statutes may include fines up to $10,000 and/or imum imprisonment of between 6 months and 5 years.)	TYPED OR PRINTED NAME		CERTIFICATE NUMBER		
	PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		TELEPHONE	804-453-4211	
	TYPED OR PRINTED NAME	SIGNATURE		YEAR	MO. DAY

RMITTEE NAME/ADDRESS (INCLUDE
CILTY NAME/LOCATION IF DIFFERENT)

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

DEPT. OF
(F

Piedmont Re
4949-A Cox

Glen Allen,

.ME Omega Protein - Reedville
DRESS PO Box 175
Reedville, VA 22539

VA0003867	002
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	2009	09	01	TO	2009	09	30

CILITY
CATION 610 Menhaden Rd

NOTE: REA
BEF

Parameter		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE	LAB CODE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS				
MPERATURE, ATER (DEG. C)	REPORTD	*****	*****		*****	24.8	28.2	C	0	2D/W	IS	
RAM CODE: 080	REQRMNT	*****	*****		*****	NL	NL			2D/W	IS	
ITEROCOCCI	REPORTD	*****	*****		*****	91.6	*****	N/CML	0	1/W	GRAB	
RAM CODE: 140	REQRMNT	*****	*****		*****	NL	*****			1/W	GRAB	
E & GREASE	REPORTD	NO QD	NO QD	KG/D	*****	*****	*****		0	2/M	GRAB	
RAM CODE: 500	REQRMNT	25	46		*****	*****	*****			2/M	GRAB	

NERAL PERMIT REQUIREMENTS OR COMMENTS
RAMETER-SPECIFIC COMMENTS

NO QL FOR OOG

YPASSES AND ERFLOWS	TOTAL OCCURENCES	TOTAL FLOW (M.G.)	TOTAL BOD5 (K.G.)
	0	0	0

OPERATOR IN RESPONSIBLE CHARGE

Theodore Schultz	1911004868
TYPED OR PRINTED NAME	CERTIFICATE NUMBER

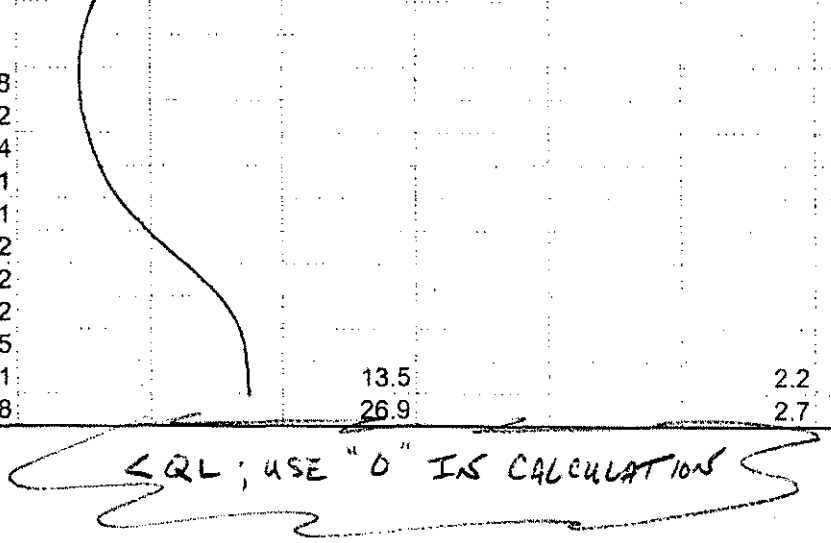
SRTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL TACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED SONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION BMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO NAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR THERING THE INFORMATION, THE INFORMATION SUBMITTED IS TO THE T OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE AND COMPLETE. I AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING SE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND RISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. & 1001 AND 33 C. & 1319. (Penalties under these statutes may include fines up to $10,000 and/or imum imprisonment of between 6 months and 5 years.)

PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		TELEPHONE	804-453-4211		
TYPED OR PRINTED NAME	SIGNATURE		YEAR	MO.	DAY

VA0003867
Sep-09
O/F 002

DEQ check by M. Dare
Omega

	flow	BOD mg/l		BOD kg/d	TSS mg/l		TSS kg/d	temp	fecal	Ecocci
1	0.154							25		
2	0.164							24.7	4	2420
3	0.174							25.5		
4	0.18							24.9		
5	0.161							26		
6	0.203							27.5		
7	0.186							28.2		
8	0.127							26.2		
9	0.086							25.7		
10	0.154	46.2	3.785	26.9	4.6	3.785	2.7	25.4	7	8.6
11	0.122							23.3		
12	0.191							20.9		
13										
14										
15	0.198							24.5		
16	0.13							27.6		
17	0.133	0	3.785	0.0	3.3	3.785	1.7	25.8	13	16
18	0.258							25		
19	0.142							26		
20										
21										
22	0.138							24.3		
23	0.152							25.1	2	92
24	0.204							25.7		
25	0.1							25.8		
26	0.251							23.9		
27	0.132							22.5		
28	0.12							22.1		
29	0.2							22.1		
30	0.135							21.3	1	210
	0.161			13.5			2.2	24.8	4	92
	0.258			26.9			2.7	28.2		



Omega
VA0003867
Sep-09
O/F 002

DEQ check by M. Dare

QL=.1

	flow	TP mg/l	TP mg/l		TP kg/d	NH3 mg/l			
1	0.154								
2	0.164	0.18	0.18	3.785	0.11				
3	0.174								
4	0.18								
5	0.161								
6	0.203								
7	0.186								
8	0.127								
9	0.086								
10	0.154	0.08	0		0.00	15.6	10	3.785	6
11	0.122								
12	0.191								
13									
14									
15	0.198								
16	0.13								
17	0.133	0.06	0		0.00	12.6	10	3.785	5
18	0.258								
19	0.142								
20									
21									
22	0.138								
23	0.152	0.07	0		0.00				
24	0.204								
25	0.1								
26	0.251								
27	0.132								
28	0.12								
29	0.2								
30	0.135	0.06	0		0.00				
	0.161	0.09	0.04		0.02	14.1			5
	0.258					15.6			6

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

DEPT. OF (F

RMITTEE NAME/ADDRESS (INCLUDE
.CILTY NAME/LOCATION IF DIFFERENT)

Piedmont Re
4949-A Cox

Glen Allen,

\ME Omega Protein - Reedville
)DRESS PO Box 175
Reedville, VA 22539

VA0003867	995
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	2009	09	01	TO	2009	09	30

.CILITY
)CATION 610 Menhaden Rd

NOTE: REA
BEF

QL = 7.4 ug/l

Parameter		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE	LAB CODE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS				
.OW	REPORTD	2.208	4.037	MGD	*****	*****	*****		0	CONT	EST	
.RAM CODE: 001)	REQRMNT	NL	NL		*****	*****	*****			CONT	EST	
I	REPORTD	*****	*****		6.91	*****	7.88	SU	0	5D/W	GRAB	
.RAM CODE: 002	REQRMNT	*****	*****		6.0	*****	9.0			5D/W	GRAB	
)PPER, TOTAL (AS J),	REPORTD	*****	*****		*****	5.6 <QL	5.6 <QL	UG/L	0	1/M	24HC	
.RAM CODE: 019	REQRMNT	*****	*****		*****	NL	NL			1/M	24HC	
:MPERATURE, ATER (DEG. C)	REPORTD	*****	*****		*****	30.5	34.3	C	0	1/DAY	IS	
.RAM CODE: 080	REQRMNT	*****	*****		*****	NL	45			1/DAY	IS	
LVER, TOTAL :ECOVERABLE	REPORTD	*****	*****		*****	<QL	<QL	UG/L	0	1/M	24HC	
.RAM CODE: 186	REQRMNT	*****	*****		*****	NL	NL			1/M	24HC	
NC, DISSOLVED S ZN) (UG/L)	REPORTD	*****	*****		*****	12.4 <QL	12.4 QL	UG/L	0	1/M	GRAB	
.RAM CODE: 448	REQRMNT	*****	*****		*****	NL	NL			1/M	GRAB	

QL = 72 ug/l

.NERAL PERMIT REQUIREMENTS OR COMMENTS:
RAMETER-SPECIFIC COMMENTS

YPASSES AND /ERFLOWS	TOTAL OCCURENCES	TOTAL FLOW (M.G.)	TOTAL BOD5 (K.G.)	OPERATOR IN RESPONSIBLE CHARGE	
	0	0	0	Theodore Schultz	1911004868

ERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL TACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED USONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION BMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO NAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR THERING THE INFORMATION, THE INFORMATION SUBMITTED IS TO THE ST OF MY KNOWLEDGE AND BELIEF TRUE, ACCURATE AND COMPLETE. I AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING LSE INFORMATION, *INCLUDING THE POSSIBILITY OF FINE AND* PRISONMENT FOR KNOWING VIOLATIONS. SEE 18 U.S.C. & 1001 AND 33 .C. & 1319. (Penalties under these statutes may include fines up to $10,000 and/or imum imprisonment of between 6 months and 5 years.)

TYPED OR PRINTED NAME		CERTIFICATE NUMBER			
PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		TELEPHONE	804-453-4211		
TYPED OR PRINTED NAME	SIGNATURE		YEAR	MO.	DAY

COURTESY OF OMEGA 5

DMR Parameter Calcs
002
2006

TKN	9/2/2009	0.164	24.600	[illegible]	**********	15.270	[illegible]	**********
	9/10/2009	0.154	17.800	**********	**********	10.375	**********	**********
	9/17/2009	0.133	14.700	**********	**********	7.400	**********	**********
	9/23/2009	0.152	22.900	**********	**********	13.175	**********	**********
	9/30/2009	0.135	25.400	**********	**********	12.979	**********	**********
	Total	**********	105.400	**********	**********	59.199	**********	**********
	No. Weeks	**********	5.000	**********	**********	5.000	**********	**********
Nitrite + Nitrate	9/2/2009	0.164	0.001	[illegible]	**********	0.001	[illegible]	**********
	9/10/2009	0.154	0.001	**********	**********	0.001	**********	**********
	9/17/2009	0.133	0.540	**********	**********	0.272	**********	**********
	9/23/2009	0.152	0.450	**********	**********	0.259	**********	**********
	9/30/2009	0.135	1.000	**********	**********	0.511	**********	**********
	Total	**********	1.992	**********	**********	1.043	**********	**********
	No. Weeks	**********	5.000	**********	**********	5.000	**********	**********
Total Nitrogen	9/2/2009	0.164	24.601	[illegible]	**********	15.271	[illegible]	**********
	9/10/2009	0.154	17.801	**********	**********	10.376	**********	**********
	9/17/2009	0.133	15.240	**********	**********	7.672	**********	**********
	9/23/2009	0.152	23.350	**********	**********	13.434	**********	**********
	9/30/2009	0.135	26.400	**********	**********	13.490	**********	**********
	Total	**********	107.392	**********	**********	60.242	**********	**********
	No. Weeks	**********	5.000	**********	**********	5.000	**********	**********
o-PO4	9/2/2009	0.164	0.001	[illegible]	**********	0.001	[illegible]	**********
	9/10/2009	0.154	0.001	**********	**********	0.001	**********	**********
	9/17/2009	0.133	0.001	**********	**********	0.001	**********	**********
	9/23/2009	0.152	0.001	**********	**********	0.001	**********	**********
	9/30/2009	0.135	0.001	**********	**********	0.001	**********	**********
	Total	**********	0.005	**********	**********	0.003	**********	**********
	No. Weeks	**********	5.000	**********	**********	5.000	**********	**********
Total P	9/2/2009	0.164	0.180	[illegible]	**********	0.112	[illegible]	**********
	9/10/2009	0.154	0.080	**********	**********	0.047	**********	**********
	9/17/2009	0.133	0.060	**********	**********	0.030	**********	**********

< QL of 0.1 ; treat as 0

COURTESY OF OMEGA

< QL of 0.1 ; treat as 0

DMR Parameter Calcs
002
2006

	9/23/2009	0.152	0.070	**********	**********	0.040	**********	**********
	9/30/2009	0.135	0.060	**********	**********	0.031	**********	**********
	Total	**********	0.450	**********	**********	0.259	**********	**********
	No. Weeks	**********	5.000	**********	**********	5.000	**********	**********

<QL of 5; treat as 0

COURTESY OF OMEGA

DMR Parameter Calcs
002
2006

Parameter	Date	Flow	Raw Data (mg/L)	Avg Raw	Max Raw	Kg/D	Avg (Kg/D)	Max (Kg/D)
	9/2/2009	0.164	**********	**********	**********	**********	**********	**********
	9/10/2009	0.154	**********	**********	**********	**********	**********	**********
	9/17/2009	0.133	**********	**********	**********	**********	**********	**********
	9/23/2009	0.152	**********	**********	**********	**********	**********	**********
	9/30/2009	0.135	**********	**********	**********	**********	**********	**********
TSS	9/10/2009	0.154	4.600	3.950	4.600	2.681	2.121	2.681
	9/17/2009	0.133	3.300	**********	**********	1.661	**********	**********
BOD	9/10/2009	0.154	46.200	25.100	46.200	26.930	14.872	26.930
	9/17/2009	0.133	4.000	**********	**********	2.014	**********	**********
O&G	9/10/2009	0.154	0.001	0.001	0.001	0.001	0.001	0.001
	9/17/2009	0.133	0.001	**********	**********	0.001	**********	**********
Fecal Coliform	9/2/2009	**********	4.000	2.5	**********	**********	**********	**********
	9/10/2009	**********	7.000	**********	**********	**********	**********	**********
	9/17/2009	**********	13.000	**********	**********	**********	**********	**********
	9/23/2009	**********	2.000	**********	**********	**********	**********	**********
	9/30/2009	**********	0.001	**********	**********	**********	**********	**********
	Total	**********	26.001	**********	**********	**********	**********	**********
	No. Weeks	**********	5.000	**********	**********	**********	**********	**********
				Exceeded				
Entero-cocci	9/2/2009	**********	2420.000	30	**********	**********	**********	**********
	9/10/2009	**********	8.600	**********	**********	**********	**********	**********
	9/17/2009	**********	16.000	**********	**********	**********	**********	**********
	9/23/2009	**********	92.000	**********	**********	**********	**********	**********
	9/30/2009	**********	210.000	**********	**********	**********	**********	**********
	Total	**********	2746.600	**********	**********	**********	**********	**********
	No. Weeks	**********	5.000	**********	**********	**********	**********	**********
NH3	9/10/2009	**********	15.600	14.100	15.600	**********	**********	**********
	9/17/2009	**********	12.600	**********	**********	**********	**********	**********

< 10 NO QL FOR O+G

< 1 treat as 1

COMMONWEALTH OF VIRGINIA – DEPARTMENT OF ENVIRONMENTAL QUALITY

GENERAL PERMIT FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS DISCHARGES AND NUTRIENT TRADING IN THE CHESAPEAKE BAY WATERSHED IN VIRGINIA

DISCHARGE MONITORING REPORT (DMR)

NAME Omega Protein - Reedville
ADDRESS PO Box 175
Reedville, VA 22539

RECEIVED OCT 13 2009 PRO
RECEIVED OCT 13 2009 PRO

FACILITY LOCATION 610 Menhaden Rd

VAN020037	501
PERMIT NUMBER	OUTFALL NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	09	09	01	TO	09	09	30

Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060-6296
804-527-5020

NOTE: READ PERMIT AND GENERAL INSTRUCTIONS BEFORE COMPLETING.

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
001 FLOW	REPORTED	3.065	**********	MGD	**********	**********	**********		Ø	CONT	Rec
	PERMIT REQUIREMENT	NL	**********		**********	**********	**********			CONT.	REC
012 PHOSPHORUS, TOTAL (AS P)	REPORTED	**********	**********		**********	0.66	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC
013 NITROGEN, TOTAL AS N	REPORTED	**********	**********		**********	8.18	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC
068 TKN (N-KJEL)	REPORTED	**********	**********		**********	8.06	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC
389 NITRITE+NITRATE-N, TOTAL	REPORTED	**********	**********	5400	**********	0.12	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC
791 NITROGEN, TOTAL AS N (MONTHLY LOAD)	REPORTED	**********	5383	LB/MO	**********	**********	**********		Ø	Month	Calc
	PERMIT REQUIREMENT	**********	NL		**********	**********	**********			MONTH	CALC
793 PHOSPHORUS, TOTAL (AS P) (MONTHLY LOAD)	REPORTED	**********	439.0	LB/MO	**********	**********	**********		Ø	Month	Calc
	PERMIT REQUIREMENT	**********	NL		**********	**********	**********			MONTH	CALC
795 ORTHOPHOSPHATE (AS P)	REPORTED	**********	**********	432	**********	0.29	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS:

BYPASSES AND OVERFLOWS	Total Occurrences	Total Flow (MGD)	Total BOD, (kg/d)
	None	Ø	Ø

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUES MAY INCLUDE FINES UP TO $10,000 AND/OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS.)

OPERATOR IN RESPONSIBLE CHARGE

Theodore Schultz	Theodore Schultz	1911004868	DATE: YEAR 09 MO 10 DAY 08
TYPED OR PRINTED NAME	SIGNATURE	CERTIFICATE NO.	

PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

William E Rueckert	William E Rueckert	804-453-4211	DATE: YEAR 09 MO 10 DAY 08
TYPED OR PRINTED NAME	SIGNATURE	Area Code/Number	

EXPRESS FLOW TO NEAREST 0.01 MGD

ROUND LB/DAY TO NEAREST WHOLE #

O/F 501	Sep-09	Omega	VAN020037		
DEQ check by M. Dare					
	flow	TP mg/l		TP lb	
1	3.86	1.36	8.3438		44
2	3.10				
3	3.63				
4	3.99				
5	1.86				
6					
7					
8	2.04				
9	2.13	0.35	8.3438		6
10	3.90				
11					
12					
13					
14	4.25				
15	4.08	0.56	8.3438		19
16	3.90				
17	4.25				
18	4.25				
19	0.58				
20					
21	1.77				
22	4.08	0.28	8.3438		10
23	3.46				
24	3.81				
25	2.93				
26	2.30				
27	2.66				
28	1.15				
29	3.55				
30	2.04	0.76	8.3438		13
AV	3.07	0.66			18
MAX	4.25			x24	
lb/mo					432

EXPRESS CONCENTRATION TO NEAREST 0.01 mg/l

EXPRESS FLOW TO NEAREST 0.01 MGD

ROUND LB/DAY TO NEAREST WHOLE #

O/F 501	Sep-09 Omega		VAN020037			
DEQ check by M. Dare						
	flow	TKN	NO2/NO3	TN mg/l		TN lb
1	3.86	14.8	0.05	14.85	8.3438	478
2	3.10					
3	3.63					
4	3.99					
5	1.86					
6						
7						
8	2.04					
9	2.13	2.4	0.32	2.72	8.3438	48
10	3.90					
11						
12						
13						
14	4.25					
15	4.08	8.4	0.05	8.45	8.3438	287
16	3.90					
17	4.25					
18	4.25					
19	0.58					
20						
21	1.77					
22	4.08	3	0.3	3.3	8.3438	112
23	3.46					
24	3.81					
25	2.93					
26	2.30					
27	2.66					
28	1.15					
29	3.55					
30	2.04	11.7	0.05	11.75	8.3438	200
AV	3.07	8.06	0.15	8.21		225
MAX	4.25				x24	
lb/mo						5400

EXPRESS CONCENTRATION TO NEAREST 0.01 mg/l

COMMONWEALTH OF VIRGINIA - DEPARTMENT OF ENVIRONMENTAL QUALITY

GENERAL PERMIT FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS DISCHARGES AND NUTRIENT TRADING IN THE CHESAPEAKE BAY WATERSHED IN VIRGINIA

DISCHARGE MONITORING REPORT (DMR)

RECEIVED
OCT 13 2009
PRO

NAME Omega Protein - Reedville
ADDRESS PO Box 175
Reedville, VA 22539

FACILITY LOCATION 610 Menhaden Rd

VAN020037	502
PERMIT NUMBER	OUTFALL NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	09	09	01	TO	09	09	30

Department of Environmental Quality
Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060-6296
804-527-5020

NOTE: READ PERMIT AND GENERAL INSTRUCTIONS BEFORE COMPLETING.

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX.	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		AVERAGE	MAXIMUM	UNITS	MINIMUM	AVERAGE	MAXIMUM	UNITS			
001 FLOW	REPORTED	0.161	**********	MGD	**********	**********	**********		Ø	Cont	Rec
	PERMIT REQUIREMENT	NL	**********		**********	**********	**********			CONT.	REC
012 PHOSPHORUS, TOTAL (AS P)	REPORTED	**********	**********		**********	0.09	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC
013 NITROGEN, TOTAL AS N	REPORTED	**********	**********		**********	21.5	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC
068 TKN (N-KJEL)	REPORTED	**********	**********		**********	21.1	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC
389 NITRITE+NITRATE-N, TOTAL	REPORTED	**********	**********	102	**********	0.4	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC
791 NITROGEN, TOTAL AS N (MONTHLY LOAD)	REPORTED	**********	6906	LB/MO	**********	**********	**********		Ø	Month	Calc
	PERMIT REQUIREMENT	**********	NL		**********	**********	**********			MONTH	CALC
793 PHOSPHORUS, TOTAL (AS P) (MONTHLY LOAD)	REPORTED	**********	2197	LB/MO	**********	**********	**********		Ø	Month	Calc
	PERMIT REQUIREMENT	**********	NL		**********	**********	**********			MONTH	CALC
795 ORTHOPHOSPHATE (AS P)	REPORTED	**********	**********	3	**********	<QL	**********	MG/L	Ø	1/W	24HC
	PERMIT REQUIREMENT	**********	**********		**********	NL	**********			2/M	8 HC

ADDITIONAL PERMIT REQUIREMENTS OR COMMENTS:

DO NOT USE <QL

BYPASSES AND OVERFLOWS	Total Occurrences	Total Flow (MGD)	Total BOD_5 (kg/d)
	None	Ø	Ø

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1319. (PENALTIES UNDER THESE STATUES MAY INCLUDE FINES UP TO $10,000 AND/OR MAXIMUM IMPRISONMENT OF BETWEEN 6 MONTHS AND 5 YEARS.)

OPERATOR IN RESPONSIBLE CHARGE			DATE		
			YEAR	MO	DAY
Theodore Schultz	Theodore Schultz	191004868	09	10	08
TYPED OR PRINTED NAME	SIGNATURE	CERTIFICATE NO.			
PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT			DATE		
			YEAR	MO	DAY
William E. Rueter	William E. Rueter	804-453-4211	09	10	08
TYPED OR PRINTED NAME	SIGNATURE	Area Code/Number			

EXPRESS FLOW TO NEAREST 0.01 MGD

ROUND LB/DAY TO NEAREST WHOLE #

O/F 502	Sep-09	Omega	VAN020037			
DEQ check by M. Dare						
	flow	TKN	NO2/NO3	TN mg/l		TN lb
1	0.15					
2	0.16	24.6	0.05	24.65	8.3438	34
3	0.17					
4	0.18					
5	0.16					
6	0.20					
7	0.19					
8	0.13					
9	0.09					
10	0.15	17.8	0.32	18.12	8.3438	23
11	0.12					
12	0.19					
13						
14						
15	0.20					
16	0.13					
17	0.13	14.7	0.54	15.24	8.3438	17
18	0.26					
19	0.14					
20						
21						
22	0.14					
23	0.15	22.9	0.45	23.35	8.3438	30
24	0.20					
25	0.10					
26	0.25					
27	0.13					
28	0.12					
29	0.20					
30	0.14	25.4	1	26.4	8.3438	30
AV	0.16	21.08	0.47	21.55		27
MAX	0.26				x26	
lb/mo						702

EXPRESS CONCENTRATION TO NEAREST 0.01 mg/l

EXPRESS FLOW TO NEAREST 0.01 MGD

O/F 502	Sep-09	Omega	VAN020037	
DEQ check by M. Dare				
	flow	TP mg/l		TP lb
1	0.15			
2	0.16	0.18	8.3438	0.25
3	0.17			
4	0.18			
5	0.16			
6	0.20			
7	0.19			
8	0.13			
9	0.09			
10	0.15	0.08	8.3438	0.10
11	0.12			
12	0.19			
13				
14				
15	0.20			
16	0.13			
17	0.13	0.06	8.3438	0.07
18	0.26			
19	0.14			
20				
21				
22	0.14			
23	0.15	0.07	8.3438	0.09
24	0.20			
25	0.10			
26	0.25			
27	0.13			
28	0.12			
29	0.20			
30	0.14	0.06	8.3438	0.07
AV	0.16	0.09		0.11
MAX	0.26			X26
lb/mo				2.86
lb/mo				round to 3

WHERE DAILY LOADS WOULD ROUND TO ZERO, IT IS RECOMMENDED THAT DAILY LOADS ARE LEFT AS IS AND THEN ROUNDED FOR MONTHLY LOAD.

EXPRESS CONCENTRATION TO NEAREST 0.01 mg/l

EXCERPT FROM NUTRIENT GENERAL PERMIT

E. Monitoring requirements.

1. Discharges shall be monitored by the permittee, during weekdays, as specified below:

STP design flow	>20.000 MGD	1.000- 19.999 MGD	0.040-0.999 MGD
Effluent TN load limit for industrial facilities		>100000 lb/yr	487-99999 lb/yr
Effluent TP load limit for industrial facilities		>10000 lb/yr	37-9999 lb/yr
Parameter	**Sample Type and Collection Frequency**		
Flow	Totalizing, Indicating and Recording		
Nitrogen Compounds (Total Nitrogen = TKN + NO_2^- (as N) + NO_3^- (as N))	24 HC 3 Days/Week	24 HC 1/Week	8 HC 2/Month, > 7 days apart
Phosphorus Compounds (Total Phosphorus and Orthophosphate)	24 HC 3 Days/Week	24 HC 1/Week	8 HC 2/Month, > 7 days apart

2. Monitoring for compliance with effluent limitations shall be performed in a manner identical to that used to determine compliance with effluent limitations established in the individual VPDES permit, and monitoring or sampling shall be conducted according to analytical laboratory methods approved under 40 CFR Part 136 (2006), unless other test or sample collection procedures have been requested by the permittee and approved by the Department in writing. Monitoring may be performed by the permittee at frequencies more stringent than listed above; however, the permittee shall report all results of such monitoring.

3. Loading values reported in accordance with Part I, Paragraphs E and F of this general permit shall be calculated and reported to the nearest pound without regard to mathematical rules of precision.

4. Data shall be reported on a form provided by the Department, by the same date each month as is required by the facility's individual permit. The total monthly load shall be calculated in accordance with the following formula:

$$ML = ML_{avg} * d$$

where:
ML = total monthly load (lb/mo)
ML_{avg} = monthly average load as reported on DMR (lb/d)
d = number of discharge days in the calendar month

$$ML_{avg} = \frac{\sum DL}{s}$$

where:
DL = daily load, = daily concentration (expressed as mg/l to the nearest 0.01 mg/l) multiplied by the flow volume of effluent discharged during the 24-hour period (expressed as MGD to the nearest 0.01 MGD), multiplied by 8.3438 and rounded to the nearest whole number to convert to pounds per day (lbs/day)
s = number of days in the calendar month in which a sample was collected and analyzed

All daily concentration data below the quantification level (QL) for the analytical method used should be treated as half the QL. All daily concentration data equal to or above the QL for the analytical method used shall be treated as it is reported.

The total year-to-date mass load shall be calculated in accordance with the following formula:

$$AL\text{-}YTD = \sum_{(Jan\text{-}current\ month)} ML$$

where:
AL-YTD = calendar year-to-date annual load (lb/yr)
ML = total monthly load (lb/mo) as reported on DMR

Dare,Michael

From: Spicer,Jason
Sent: Tuesday, September 01, 2009 11:39 AM
To: Dare,Michael
Cc: Stell,Steven; Brockenbrough,Allan; Staples,Wayne; Cunningham,Frederick
Subject: RE:

Michael,

When rounding daily or monthly loads for the NGP permit, permittees should not use zero. It is recommended that daily loads are left as is and then rounded for monthly load.

Jason T. Spicer
Operator Training Program
Office of Water Permits and Compliance Assistance
Virginia Department of Environmental Quality

P.O. Box 1105
Richmond, VA 23218

Phone: (804) 698-4143
Fax: (804) 698-4032
Email: jason.spicer@deq.virginia.gov
Web: www.deq.virginia.gov/tptp/

To receive wastewater operator training program announcements by email, signup at http://www.deq.virginia.gov/lists/***www.deq.virginia.gov/lists/.***

Please note: Virginia's Freedom of Information Act (FOIA) requires that public documents be available for review upon request. This e-mail communication, your reply, and future e-mails may therefore be subject to public disclosure.

Attachment 7 – Effluent Limitation Development – Outfall 002

Attachment 9

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Water Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296 804/527-5020

SUBJECT: Cockrell's Creek Wasteload Allocations and Dilution Analysis
Zapata Protein (USA), Inc. Discharge (VA0003867)

TO: Denise Mosca

FROM: Jon van'Soestbergen

DATE: September 17, 1998

COPIES: Dale Phillips, Curt Linderman

Per your request, I have reviewed the BOD wasteload allocations for the subject discharge to Cockrell's Creek. I also constructed a CORMIX model to analyze dilution ratios at the discharge associated with different diffuser designs. Two discharges (Ampro Fisheries and Zapata Protein) previously competed for the available assimilative capacity of the receiving stream, and previous models and analyses simulated both discharges to allocate wasteloads. However, the Ampro discharge was terminated. The purpose of this review was to determine if the BOD wasteload previously allocated to Ampro was available in part, or in total, to Zapata. The CORMIX analysis of a diffuser for outfall number 002 was performed to determine the dilution ratio for establishing wasteload allocations for conservative parameters.

BOD Wasteload Allocation Review

In September 1976, the Virginia Institute of Marine Sciences (VIMS) completed a mathematical water quality study of the Great Wicomico River and Cockrell's Creek. The model determined that an average of 5,000 lbs/day of BOD_5 would maintain water quality standards in the upper layer of the creek, which was the only layer used to determine the pollutant loading to the creek. Of this total, 4,900 lbs/day would be allocated to Ampro (then known as Standard Products) and Zapata.

My review of the available information leads me to conclude that the total allowable loading to Cockrell's Creek is 5,000 lbs/day of BOD_5, regardless of the point of discharge. Therefore, with the termination of the Ampro discharge, the entire 4,900 lbs/day previously allocated to the two discharges is available for allocation to Zapata.

CORMIX Diffuser Analysis

Zapata currently proposes to discharge through a total of four outfalls to Cockrell's Creek, but only outfall 002 was considered for a diffuser. The proposed discharge flow from this outfall is 0.300 mgd. The complex design of the diffuser included with the permit fact sheet can not be accurately analyzed using the CORMIX model. However, by simplifying the design somewhat, the expected dilution the diffuser will provide could be estimated. In addition to analyzing the design of this diffuser, a modified design was analyzed which affords better dilution in the near field.

Two diffuser designs were analyzed; one which closely approximates the design included in the fact sheet ("short diffuser") and one which affords better dilution ("long diffuser"). For each case, dilution was analyzed relative to one-hour averages under critical conditions, which most closely approximates the way the acute standards are written.

Omega Fact Sheet
Attachment 9

"Short Diffuser" - This diffuser design consists of a 12-inch diameter pipe extending 35 feet perpendicular to the east bank of the creek into water of approximately 5 foot depth. The diffuser line (the part with holes) starts 15 feet from the shore and extends to the end of the diffuser (20 feet). There are 13 holes of 4 inch diameter in the top of the pipe, and the end is blocked such that all flow is directed upward through the diffuser ports (holes). A rough sketch of the diffuser is attached.

This "short diffuser" design results in a dilution of 50:1 at the boundary of the mixing zone. This dilution ratio should be used to determine both acute and chronic WLAs for the discharge. The associated mixing zone boundary is 7.62 meters (25 feet) measured in a circle from the diffuser midpoint.

"Long Diffuser" - This diffuser consists of a 12-inch diameter pipe extending 60 feet perpendicular to the east bank of the creek, also into water of approximately 5 foot depth. The diffuser line starts 20 feet from shore and extends to the end of the diffuser (40 feet). There are 8 holes of 4 inch diameter, located such that flow will be directed in a 45 degree angle toward the water surface in the downstream direction during ebb tide. Again, the end of the pipe is closed so that all flow discharges through the diffuser ports. A rough sketch of the diffuser is attached.

This "long diffuser" design results in a dilution of 100:1 at the boundary of the mixing zone. This dilution should be used for both the acute and chronic WLAs for the discharge. The associated mixing zone boundary is 6.10 meters (20 feet) measured in a circle from the diffuser midpoint.

Conclusions and Recommendation

The BOD_5 wasteload available to Zapata Protein is 4,900 lbs/day.

If the "short diffuser" is specified, a dilution ratio of 50:1 should be used. For the "long diffuser", the dilution ratio can be increased to 100:1. This shows that different diffuser designs can result in dramatically different dilution ratios, and thus need to be taken into consideration when establishing wasteload allocations and permit limits. As such, it is important that the diffuser design be specified for a wasteload allocation based on a given dilution ratio. It is recommended that the alternate diffuser designs be presented to the permittee so that the advantages of each design can be considered. The designs presented should serve only as preliminary designs. The sketches provided herewith should in no way be construed as final diffuser designs. Alternate designs not yet considered are also possible, and can be submitted by the permittee for subsequent analysis using CORMIX.

Pertinent documentation for the CORMIX analysis is included herewith. Should you have any questions or need additional information, please do not hesitate to contact me.

Attachment:

Notes and Model Runs - Zapata Cormix Diffuser Analysis - Cockrell's Creek, 09/16/1998, 24 pages

ZAPATA CORMIX DIFFUSER ANALYSIS - COCKRELL'S CREEK 9.16.98

VA DEQ - PRO J. VAN SOESTBERGEN

MODEL RUN SUMMARIES.

6 SEPARATE SCENARIOS WERE RUN TO OBTAIN AVERAGE DILUTION RATIOS RELATIVE TO THE ACUTE STANDARD FOR TWO DIFFERENT DIFFUSER DESIGNS. THREE SCENARIOS WERE NECESSARY FOR EACH DESIGN; AFTER-SLACK (FLOW UP THE CREEK), SLACK (NO AMBIENT FLOW), AND BEFORE-SLACK (FLOW DOWN THE CREEK).

TWO DIFFUSER DESIGNS WERE SIMULATED; SHORT DIFFUSER AND LONG DIFFUSER. SHORT DIFFUSER MOST CLOSELY REPRESENTS THE PROPOSED DIFFUSER DESIGN SUBMITTED BY THE PERMITTEE. LONG DIFFUSER IS A PRO-DESIGNED ALTERNATIVE THAT RESULTS IN BETTER DILUTION IN THE NEAR-FIELD UNDER EBB OR FLOW-TIDE CONDITIONS.

THE FILES ARE AS FOLLOWS

ZAPATA1 : AFTER-SLACK ; SHORT DIFFUSER

ZAPATA2 : SLACK TIDE

ZAPATA3 : BEFORE-SLACK

ZAPATA4 : AFTER-SLACK ; LONG DIFFUSER

ZAPATA5 : SLACK TIDE

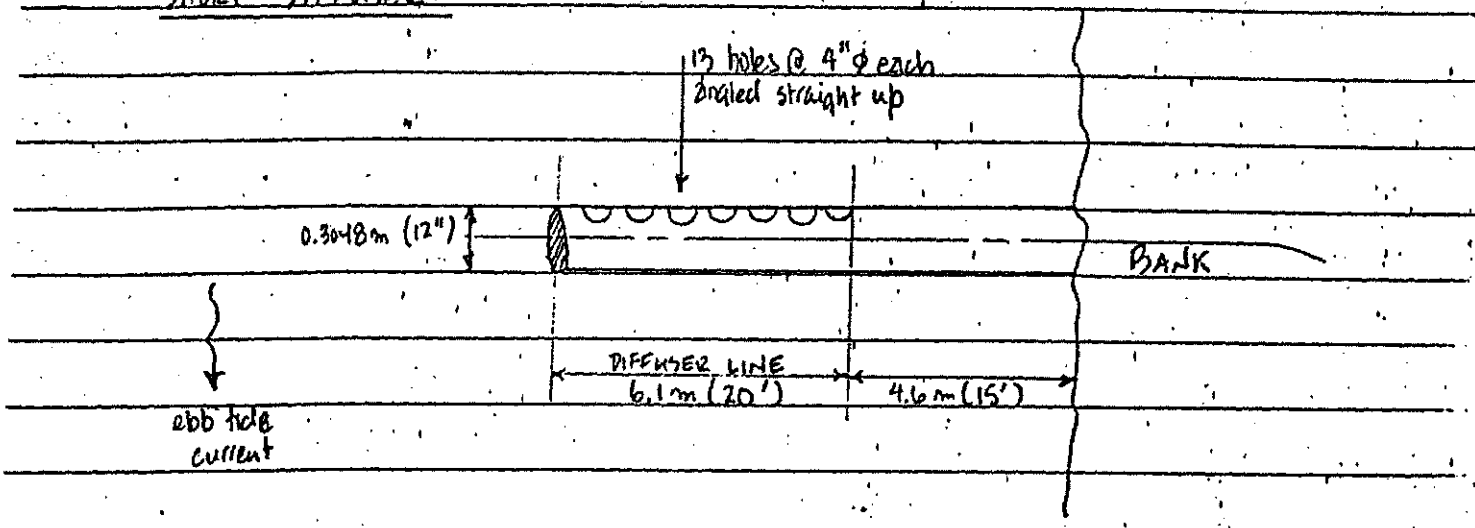
ZAPATA6 : BEFORE SLACK.

ALL SCENARIOS WERE RUN USING CORMIX2 ; I.E. A MULTIPORT SUBMERGED DIFFUSER.

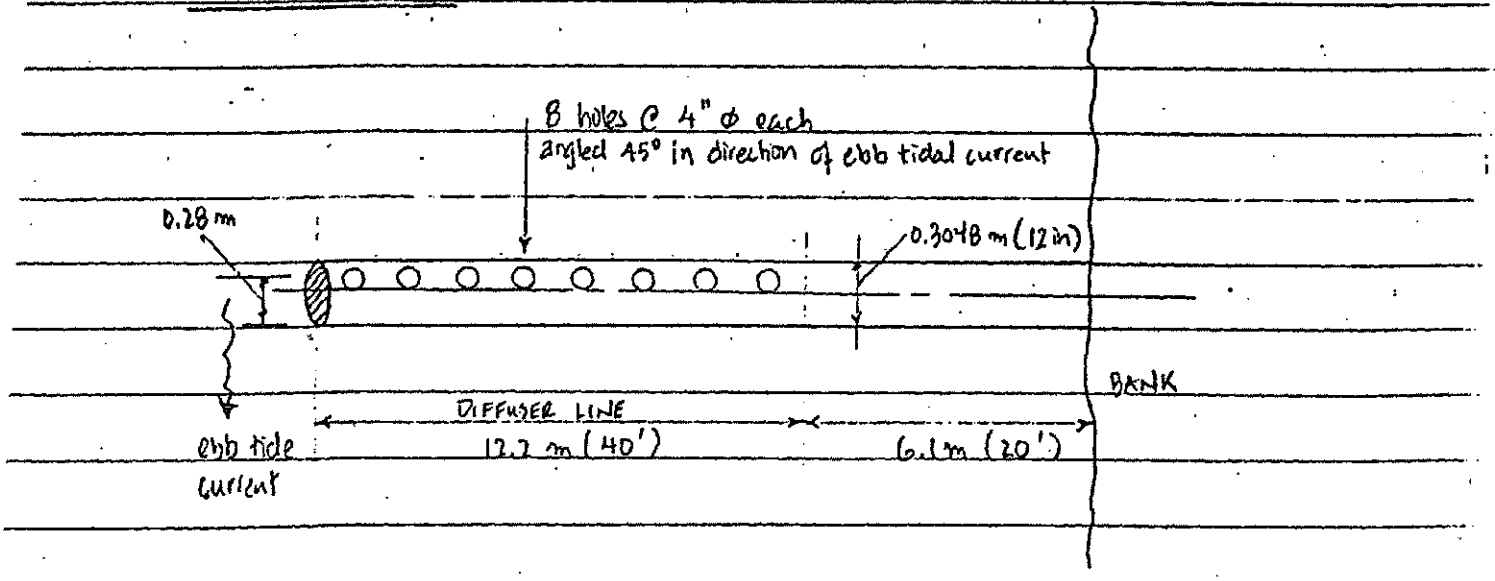
DESIGN SKETCHES OF THE TWO DIFFUSERS ARE ATTACHED.

ZAPATA CORMIX DIFFUSER ANALYSIS - COCKRELL'S CREEK - 9.16.98

SHORT DIFFUSER:



LONG DIFFUSER:



ZAPATA CORMIX DIFFUSER ANALYSIS - 9-16-98

AMBIENT DATA

CHANNEL TYPE :	BOUNDED
WIDTH OF CHANNEL:	503 m
CHANNEL APPEARANCE:	FAIRLY STRAIGHT & UNIFORM
AVERAGE DEPTH:	1.524 m
ACTUAL DEPTH @ DISCH:	1.524 m
AMBIENT FLOW FIELD:	TIDAL REVERSING
PERIOD OF REVERSAL:	12.4 hr SEMI-DIURNAL
FLOW CONDITION :	① AFTER SLACK ; ② SLACK ; ③ BEFORE SLACK
TIME :	1.0 HR
INSTANTANEOUS AMBIENT VEL :	0.15 m/s
MAXIMUM AMBIENT VELOCITY :	0.30 m/s
MANNING'S "n" :	0.07
DENSITY CONDITIONS :	UNIFORM
FRESH OR NON-FRESH :	NON FRESH
AMBIENT DENSITY:	999.7 kg/m^3
WIND SPEED:	2 m/s

ZAPATA CORMIX DIFFUSER ANAUYSIS 9.16.98

DISCHARGE DATA

	SHORT	LONG
LENGTH OF DIFFUSER LINE:	6.1 m	12.2 m
BANK DIRECTION:	LEFT	LEFT
DISTANCE TO FIRST NOZZLE:	4.6 m	6.1 m
DISTANCE TO LAST NOZZLE:	10.7 m	18.3 m
ALIGNMENT ANGLE:	90	90
NUMBER OF OPENINGS:	13	8
SINGLE PORTS:	YES (A)	YES (A)
DIAMETER OF PORTS:	0.1 m	0.1 m
CONTRACTION COEFFICIENT:	1.0	1.0
HEIGHT OF PORT CENTERS:	0.3048 m	0.28 m
UNIDIRECTIONAL OR ALTERNATING:	ALTERNATING (B)	UNIDIRECTIONAL (A)
AVERAGE VERTICAL ANGLE:	—	90 45
RELATIVE ORIENTATION ANGLE:	—	90
SAME DIRECTION OR FANNED OUT:	SAME (A)	SAME (A)
HORIZONTAL ANGLE OF DISCHARGE:	—	0
DIFFUSER FLOW RATE:	0.0131 m/s	0.0131 m/s
FRESHWATER EFFLUENT:	YES	YES
TEMPERATURE:	27.7°C	27.7°C
HEATED DISCHARGE:	NO	NO
UNITS:	PPB	PPB
CONCENTRATION:	1000	1000
CONSERVATIVE SUBSTANCE:	YES	YES

ZAPATA CORMIX DIFFUSER ANALYSIS 9.16.98

MIXING ZONE SPECIFICATION

EFFLUENT TOXIC BY USEPA STANDARDS:	NO
AMBIENT WATER QUALITY STANDARDS:	NO
RMZ SPECIFICATION:	NO
MAX DISTANCE OF REGION OF INTEREST:	6,000 m
NUMBER OF OUTPUT DISPLAY STEPS:	10

Attachment 9
6/24

ZAPATA CORP'N. DIFFUSER ANALYSIS — 9-16-98

SUMMARY OF RESULTS

① SHORT DIFFUSER

FILE	AMBIENT SCENARIO	S
ZAPATA1	AFTER-SLACK	97.3
ZAPATA2	SLACK	5.8
ZAPATA3	BEFORE-SLACK	105.6

CONSERVATIVE AVERAGE = (97.3 + 5.8) / 2 = 51.6 SAY 50:1

② LONG DIFFUSER

ZAPATA4	AFTER-SLACK	197.9
ZAPATA 5	SLACK	5.1
ZAPATA 6	BEFORE-SLACK	210.8

CONSERVATIVE AVERAGE = (197.9 + 5.1) / 2 = 101.5 SAY 100:1

```
IX2 PREDICTION FILE:
2222222222222222222222222222222222222222222222222222222222222222222222
                    CORNELL MIXING ZONE EXPERT SYSTEM
ystem CORMIX2:                                                Subsystem version:
merged Multiport Diffuser Discharges     CORMIX v.3.20        September 1996
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
 DESCRIPTION
e name/label:          ZAPATA^VA0003867
sign case:             AFTER^SLACK^SHORT^DIFFUSER
LE NAME:               cormix\sim\ZAPATA1 .cx2
ne of Fortran run:     09/16/98--16:06:30

IRONMENT PARAMETERS (metric units)
unded section
    =    503.00  AS    =    766.57  QA    =    114.99  ICHREG= 1
    =      1.52  HD    =      1.52
dal Simulation at TIME =      1.000 h
RIOD=    12.40 h UAmax =       .300 dUa/dt=       .150 (m/s)/h
    =       .150 F     =       .334 USTAR = .3065E-01
    =     -2.000 UWSTAR= .2198E-02
iform density environment
RCND=  U         RHOAM =  999.7000

FUSER DISCHARGE PARAMETERS (metric units)
ffuser type:     DITYPE= alternating perpendicular
ANK  =  LEFT     DISTB =      7.65  YB1   =      4.60  YB2   =     10.70
    =      6.10  NOPEN =   13       SPAC  =       .51
    =       .100 A0    =      .008 H0    =       .30
ozzle/port arrangement:   alternating without fanning
AMMA =    90.00  THETA =     90.00  SIGMA =       .00  BETA  =     90.00
0    =       .128 Q0    =      .013       = .1310E-01
HO0  =  996.3187 DRHO0 = .3381E+01  GP0   = .3317E-01
0    = .1000E+04 CUNITS=  PPB
POLL =  1        KS    = .0000E+00  KD    = .0000E+00

UX VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
0    = .2148E-02 m0    = .2755E-03  j0    = .7123E-04  SIGNJ0=      1.0
ssociated 2-d length scales (meters)
Q=B  =       .017 lM    =       .16  lm    =       .01
mp   =  99999.00 lbp   =  99999.00  la    =  99999.00

UX VARIABLES - ENTIRE DIFFUSER (metric units)
0    = .1310E-01 M0    = .1681E-02  J0    = .4345E-03
ssociated 3-d length scales (meters)
LQ   =       .32 LM    =       .40  Lm    =       .27  Lb    =       .13
                                    Lmp   =  99999.00  Lbp   =  99999.00
Tidal:           Tu    =    .0797 h Lu    =     3.432  Lmin  =       .137

ON-DIMENSIONAL PARAMETERS
FR0  =      5.44 FRD0  =      2.22  R     =       .85
(slot)           (port/nozzle)

LOW CLASSIFICATION
2222222222222222222222222222222222222222
2  Flow class (CORMIX2)       =    MU8    2
2  Applicable layer depth HS  =     1.52  2
2222222222222222222222222222222222222222

IXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
```

```
    = .1000E+04  CUNITS=  PPB
 X  =  0
 D  =  0
MZ  =  0
 T  =   6000.00  XMAX  =   6000.00

 Z COORDINATE SYSTEM:
 ORIGIN is located at the bottom and the diffuser mid-point:
      7.65 m  from the LEFT  bank/shore.
 X-axis points downstream, Y-axis points to left, Z-axis points upward.
:P = 10 display intervals per module
-------------------------------------------------------------------------
-------------------------------------------------------------------------
:N MOD201: DIFFUSER DISCHARGE MODULE

: to complex near-field motions:  EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

>file definitions:
3V = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
3H = top-hat half-width, in horizontal plane normal to trajectory
3  = hydrodynamic centerline dilution
:  = centerline concentration (includes reaction effects, if any)

     X         Y         Z         S         C        BV        BH
    .00       .00       .30       1.0  .100E+04       .01      3.05

 OF MOD201: DIFFUSER DISCHARGE MODULE
-------------------------------------------------------------------------
-------------------------------------------------------------------------
IN MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

cause of the strong ambient current the diffuser plume of this crossflowing
discharge gets RAPIDLY DEFLECTED.
near-field zone is formed that is VERTICALLY FULLY MIXED over the entire
layer depth.  Full mixing is achieved at a downstream distance of about
five (5) layer depths.

ofile definitions:
BV = layer depth (vertically mixed)
BH = top-hat half-width, measured horizontally in y-direction
S  = hydrodynamic average (bulk) dilution
C  = average (bulk) concentration (includes reaction effects, if any)

     X         Y         Z         S         C        BV        BH
    .00       .00       .30       1.0  .100E+04       .01      3.05
    .76       .00       .35      34.2  .292E+02       .16      3.05
   1.52       .00       .40      47.5  .210E+02       .32      3.06
   2.29       .00       .44      57.4  .174E+02       .47      3.06
   3.05       .00       .49      65.4  .153E+02       .62      3.06
   3.81       .00       .53      72.3  .138E+02       .77      3.06
   4.57       .00       .58      78.3  .128E+02       .92      3.07
   5.33       .00       .62      83.7  .119E+02      1.07      3.07
   6.10       .00       .67      88.6  .113E+02      1.22      3.07
   6.86       .00       .72      93.1  .107E+02      1.37      3.08
   7.62       .00       .76      97.3  .103E+02      1.52      3.08
mulative travel time =         101. sec

 OF MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER
-------------------------------------------------------------------------
End of NEAR-FIELD REGION (NFR) **
```

N MOD241: BUOYANT AMBIENT SPREADING

charge is non-buoyant or weakly buoyant.
herefore BUOYANT SPREADING REGIME is ABSENT.

OF MOD241: BUOYANT AMBIENT SPREADING

N MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

rtical diffusivity (initial value) = .935E-02 m^2/s
rizontal diffusivity (initial value) = .117E-01 m^2/s

passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

file definitions:
V = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
= or equal to layer depth, if fully mixed
H = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
measured horizontally in Y-direction
U = upper plume boundary (Z-coordinate)
L = lower plume boundary (Z-coordinate)
= hydrodynamic centerline dilution
= centerline concentration (includes reaction effects, if any)

me Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
8.38	.00	1.52	96.4	.104E+02	1.52	3.08	1.52	.00
28.42	.00	1.52	101.1	.989E+01	1.52	3.79	1.52	.00
48.47	.00	1.52	107.7	.929E+01	1.52	4.39	1.52	.00
68.51	.00	1.52	115.9	.863E+01	1.52	4.92	1.52	.00
88.55	.00	1.52	125.6	.796E+01	1.52	5.39	1.52	.00
108.59	.00	1.52	136.4	.733E+01	1.52	5.83	1.52	.00
128.64	.00	1.52	148.3	.674E+01	1.52	6.24	1.52	.00
148.68	.00	1.52	161.1	.621E+01	1.52	6.62	1.52	.00
168.72	.00	1.52	174.5	.573E+01	1.52	6.98	1.52	.00
188.76	.00	1.52	188.5	.531E+01	1.52	7.32	1.52	.00
208.80	.00	1.52	202.8	.493E+01	1.52	7.65	1.52	.00

mulative travel time = 1437. sec

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me Stage 2 (bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
208.80	7.65	1.52	202.9	.493E+01	1.52	15.30	1.52	.00
270.00	7.65	1.52	217.1	.472E+01	1.52	15.73	1.52	.00

mulative travel time = 1845. sec

RMIX prediction has been TERMINATED at last prediction interval.
Limiting time due to TIDAL REVERSAL has been reached.

OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

MIX2: Submerged Multiport Diffuser Discharges End of Prediction File
22222222222222222222222222222222222222222222222222222222222222222222222222

Attachment 9 10/24

```
:X2 PREDICTION FILE:
:22222222222222222222222222222222222222222222222222222222222222222222
                    CORNELL MIXING ZONE EXPERT SYSTEM
                                                          Subsystem version:
/stem CORMIX2:
ierged Multiport Diffuser Discharges    CORMIX v.3.20       September 1996
-------------------------------------------------------------------------
-------------------------------------------------------------------------

 DESCRIPTION
e name/label:          ZAPATA^VA0003867
ign case:              SLACK^TIDE^SHORT^DIFFUSER
E NAME:                cormix\sim\ZAPATA2 .cx2
e of Fortran run:      09/16/98--16:08:28

RONMENT PARAMETERS (metric units)
nded section
    =    503.00  AS    =     766.57  QA    =       .00  ICHREG= 1
    =      1.52  HD    =       1.52
al Simulation at TIME =       .000 h
IOD=     12.40 h UAmax =       .300 dUa/dt=       .150 (m/s)/h
    =       .000 F     =       .334 USTAR = .0000E+00
    =      2.000 UWSTAR= .2198E-02
form density environment
CND=  U          RHOAM =  999.7000

USER DISCHARGE PARAMETERS (metric units)
fuser type:      DITYPE= alternating perpendicular
K   =  LEFT      DISTB =       7.65  YB1   =      4.60  YB2   =     10.70
    =      6.10  NOPEN =         13  SPAC  =       .51
    =      .100  A0    =       .008  H0    =       .30
zle/port arrangement:   alternating without fanning
IMA =     90.00  THETA =      90.00  SIGMA =       .00  BETA  =     90.00
    =      .128  Q0    =       .013        = .1310E-01
)0  =  996.3187  DRHO0 = .3381E+01  GP0   = .3317E-01
    = .1000E+04  CUNITS=  PPB
)LL =  1         KS    = .0000E+00  KD    = .0000E+00

: VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
    = .2148E-02  m0    = .2755E-03  j0    = .7123E-04  SIGNJ0=      1.0
sociated 2-d length scales (meters)
=B  =      .017 lM    =       .16  lm    =  99999.00
)   =  99999.00 lbp   =  99999.00  la    =  99999.00

( VARIABLES - ENTIRE DIFFUSER (metric units)
    = .1310E-01  M0    = .1681E-02  J0    = .4345E-03
sociated 3-d length scales (meters)
    =      .32  LM    =       .40  Lm    =  99999.00  Lb    =  99999.00
                                   Lmp   =  99999.00  Lbp   =  99999.00
                Tu    =    .0797 h  Lu    =     3.432  Lmin  =      .137
ial:

-DIMENSIONAL PARAMETERS
)   =     5.44  FRD0  =      2.22  R     =  99999.00
lot)            (port/nozzle)

N CLASSIFICATION
22222222222222222222222222222222222222
 Flow class (CORMIX2)       =    MU1V   2
 Applicable layer depth HS  =    1.52   2
22222222222222222222222222222222222222

ING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
```

```
    = .1000E+04  CONITS=  PPB
    =  0
    =  0
  Z =  0
    =   6000.00  XMAX  =   6000.00

 COORDINATE SYSTEM:
RIGIN is located at the bottom and the diffuser mid-point:
     7.65 m  from the LEFT  bank/shore.
-axis points downstream, Y-axis points to left, Z-axis points upward.
 = 10 display intervals per module
-----------------------------------------------------------------------
-----------------------------------------------------------------------
 MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)

itial conditions for individual jet/plume:
verage spacing between jet/plumes:      .51 m
   X         Y         Z         S         C         BV        BH
  .00       .00       .30       1.0   .100E+04     .05       .05

OF MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)
-----------------------------------------------------------------------
-----------------------------------------------------------------------
N CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

/plume transition motion in weak crossflow.

e of flow establishment:              THETAE=     90.00  SIGMAE=       .00
    =       .00  XE    =        .00  YE    =       .00  ZE    =       .30

file definitions:
V = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
H = before merging: Gaussian 1/e (37%) half-width in horizontal plane
                    normal to trajectory
    after merging:  top-hat half-width in horizontal plane
                    parallel to diffuser line
  = hydrodynamic centerline dilution
  = centerline concentration (includes reaction effects, if any)

    X         Y         Z         S         C         BV        BH
ndividual jet/plumes before merging:
    .00       .00       .30       1.0   .100E+04     .05       .05
    .00       .00       .41       1.1   .877E+03     .06       .06
    .00       .00       .52       1.5   .669E+03     .07       .07
    .00       .00       .62       1.9   .526E+03     .08       .08
    .00       .00       .73       2.3   .426E+03     .09       .09
    .00       .00       .84       2.8   .353E+03     .10       .10
    .00       .00       .94       3.4   .298E+03     .11       .11
    .00       .00      1.05       3.9   .255E+03     .12       .12
    .00       .00      1.16       4.5   .222E+03     .13       .13
    .00       .00      1.27       5.1   .195E+03     .14       .14
    .00       .00      1.37       5.8   .173E+03     .15       .15
mulative travel time =            7. sec
lerging of individual jet/plumes not found in this module, but interaction
 will occur in following module.  Overall jet/plume interaction dimensions:
    .00       .00      1.37       5.8   .173E+03     .15      3.10

) OF CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION
-----------------------------------------------------------------------
-----------------------------------------------------------------------
```

MOD232: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

tical angle of layer/boundary impingement " = 90.00 deg
izontal angle of layer/boundary impingement" = .00 deg

charge into STAGNANT AMBIENT environment:
STEADY-STATE MIXING CONDITION IS NOT POSSIBLE in this zone,
even though some ADDITIONAL DILUTION MAY OCCUR!
lso, all far-field processes will be UNSTEADY.
ULATION STOPS because of stagnant ambient conditions.

)F MOD232: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

---

id of NEAR-FIELD REGION (NFR) **

JLATION STOPS because of STAGNANT AMBIENT conditions.
l1 far-field processes will be UNSTEADY.

[X2: Submerged Multiport Diffuser Discharges End of Prediction File
22222222222222222222222222222222222222222222222222222222222222222222

```
:X2 PREDICTION FILE:
:2222222222222222222222222222222222222222222222222222222222222222222222
                    CORNELL MIXING ZONE EXPERT SYSTEM
                                                          Subsystem version:
/stem CORMIX2:
nerged Multiport Diffuser Discharges     CORMIX v.3.20      September 1996
-------------------------------------------------------------------------
-------------------------------------------------------------------------

 DESCRIPTION
e name/label:          ZAPATA^VA0003867
                       BEFORE^SLACK^SHORT^DIFFUSER
ign case:              cormix\sim\ZAPATA3 .cx2
E NAME:
e of Fortran run:      09/16/98--16:10:17

RONMENT PARAMETERS (metric units)
nded section
    =     503.00  AS    =     766.57  QA    =     114.99  ICHREG= 1
    =       1.52  HD    =       1.52
al Simulation at TIME =      -1.000 h
IOD=      12.40 h UAmax =        .300 dUa/dt=        .150 (m/s)/h
    =        .150 F     =        .334 USTAR = .3065E-01
    =      2.000 UWSTAR= .2198E-02
form density environment
CND=  U          RHOAM =  999.7000

USER DISCHARGE PARAMETERS (metric units)
fuser type:      DITYPE= alternating perpendicular
K  =  LEFT       DISTB =       7.65  YB1   =       4.60  YB2   =      10.70
    =      6.10  NOPEN =   13        SPAC  =        .51
    =      .100  A0    =       .008 H0    =        .30
zle/port arrangement:   alternating without fanning
MA =      90.00  THETA =      90.00  SIGMA =        .00  BETA  =      90.00
    =       .128 Q0    =       .013       = .1310E-01
)0  =   996.3187 DRHO0 = .3381E+01  GP0   = .3317E-01
    = .1000E+04  CUNITS=  PPB
)LL =  1         KS    = .0000E+00  KD    = .0000E+00

: VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
    = .2148E-02  m0    = .2755E-03  j0    = .7123E-04  SIGNJ0=       1.0
sociated 2-d length scales (meters)
:B  =       .017 lM    =       .10  lm    =       .01
)   =  99999.00  lbp   =  99999.00  la    =  99999.00

: VARIABLES - ENTIRE DIFFUSER (metric units)
    = .1310E-01  M0    = .1681E-02  J0    = .4345E-03
sociated 3-d length scales (meters)
    =       .32  LM    =       .40  Lm    =       .27  Lb    =       .13
                                    Lmp   =  99999.00  Lbp   =  99999.00
                 Tu    =    .0797 h Lu    =     3.432  Lmin  =       .137
ial:

-DIMENSIONAL PARAMETERS
)   =      5.44  FRD0  =      2.22  R     =       .85
lot)             (port/nozzle)

N CLASSIFICATION
2222222222222222222222222222222222222
 Flow class (CORMIX2)       =    MU8    2
 Applicable layer depth HS  =     1.52  2
2222222222222222222222222222222222222

ING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
```

= .1000E+04 CUNITS= PPB
= 0
= 0
Z = 0
= 6000.00 XMAX = 6000.00

COORDINATE SYSTEM:
RIGIN is located at the bottom and the diffuser mid-point:
7.65 m from the LEFT bank/shore.
-axis points downstream, Y-axis points to left, Z-axis points upward.
= 10 display intervals per module

I MOD201: DIFFUSER DISCHARGE MODULE

to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

ile definitions:
/ = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
H = top-hat half-width, in horizontal plane normal to trajectory
= hydrodynamic centerline dilution
= centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05

OF MOD201: DIFFUSER DISCHARGE MODULE

N MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

ause of the strong ambient current the diffuser plume of this crossflowing
ischarge gets RAPIDLY DEFLECTED.
ear-field zone is formed that is VERTICALLY FULLY MIXED over the entire
ayer depth. Full mixing is achieved at a downstream distance of about
ive (5) layer depths.

file definitions:
V = layer depth (vertically mixed)
H = top-hat half-width, measured horizontally in y-direction
= hydrodynamic average (bulk) dilution
= average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.30	1.0	.100E+04	.01	3.05
.76	.00	.35	34.6	.289E+02	.16	3.05
1.52	.00	.40	48.4	.207E+02	.32	3.06
2.29	.00	.44	58.9	.170E+02	.47	3.06
3.05	.00	.49	67.8	.148E+02	.62	3.06
3.81	.00	.53	75.5	.132E+02	.77	3.06
4.57	.00	.58	82.5	.121E+02	.92	3.07
5.33	.00	.62	88.9	.112E+02	1.07	3.07
6.10	.00	.67	94.8	.105E+02	1.22	3.07
6.86	.00	.72	100.4	.996E+01	1.37	3.08
7.62	.00	.76	105.6	.947E+01	1.52	3.08

mulative travel time = 101. sec

OF MOD277: UNSTABLE NEAR-FIELD ZONE OF ALTERNATING PERPENDICULAR DIFFUSER

** NEAR-FIELD REGION (NFR) **

MOD241: BUOYANT AMBIENT SPREADING

harge is non-buoyant or weakly buoyant.
herefore BUOYANT SPREADING REGIME is ABSENT.

OF MOD241: BUOYANT AMBIENT SPREADING

MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

rtical diffusivity (initial value) = .935E-02 m^2/s
rizontal diffusivity (initial value) = .117E-01 m^2/s

passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

file definitions:
V = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
= or equal to layer depth, if fully mixed
H = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
measured horizontally in Y-direction
U = upper plume boundary (Z-coordinate)
L = lower plume boundary (Z-coordinate)
= hydrodynamic centerline dilution
= centerline concentration (includes reaction effects, if any)

me Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
8.38	.00	1.52	105.4	.949E+01	1.52	3.08	1.52	.00
28.42	.00	1.52	126.0	.794E+01	1.52	3.79	1.52	.00
48.47	.00	1.52	143.4	.698E+01	1.52	4.39	1.52	.00
68.51	.00	1.52	159.2	.628E+01	1.52	4.92	1.52	.00
88.55	.00	1.52	174.1	.574E+01	1.52	5.39	1.52	.00
108.59	.00	1.52	188.4	.531E+01	1.52	5.83	1.52	.00
128.64	.00	1.52	202.3	.494E+01	1.52	6.24	1.52	.00
148.68	.00	1.52	215.7	.464E+01	1.52	6.62	1.52	.00
168.72	.00	1.52	228.8	.437E+01	1.52	6.98	1.52	.00
188.76	.00	1.52	241.5	.414E+01	1.52	7.32	1.52	.00
208.80	.00	1.52	253.8	.394E+01	1.52	7.65	1.52	.00

mulative travel time = 1437. sec

---

ime Stage 2 (bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
208.80	7.65	1.52	253.8	.394E+01	1.52	15.30	1.52	.00
235.64	7.65	1.52	257.7	.389E+01	1.52	15.49	1.52	.00

mulative travel time = 1616. sec

RMIX prediction has been TERMINATED at last prediction interval.
Limiting distance due to TIDAL REVERSAL has been reached.

OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

MIX2: Submerged Multiport Diffuser Discharges End of Prediction File
22222222222222222222222222222222222222222222222222222222222222222222222222

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```
(2 PREDICTION FILE:                          2222222222222222222222222222222222222222222
2222222222222222222222222222222222222222222222222222222222222222222222222222222222222
                    CORNELL MIXING ZONE EXPERT SYSTEM
                                                              Subsystem version:
stem CORMIX2:                                 CORMIX v.3.20     September 1996
erged Multiport Diffuser Discharges
-----------------------------------------------------------------------------------
-----------------------------------------------------------------------------------

DESCRIPTION
 name/label:                ZAPATA^VA0003867
                            AFTER^SLACK^-^LONG^DIFFUSER
gn case:                    cormix\sim\ZAPATA4 .cx2
 NAME:                      09/16/98--15:18:57
 of Fortran run:

ONMENT PARAMETERS (metric units)
ded section
   =     503.00  AS     =     766.57  QA     =     114.99  ICHREG= 1
   =       1.52  HD     =       1.52
l Simulation at TIME =        1.000 h
OD=      12.40 h UAmax =        .300 dUa/dt=        .150 (m/s)/h
   =       .150  F      =        .334 USTAR = .3065E-01
   =      2.000  UWSTAR= .2198E-02
form density environment
ND=  U           RHOAM =  999.7000

USER DISCHARGE PARAMETERS (metric units)
fuser type:      DITYPE= unidirectional perpendicular
K  =  LEFT       DISTB =      12.20  YB1     =     6.10  YB2     =     18.30
   =      12.20  NOPEN =      8      SPAC    =     1.74
   =       .100  A0    =       .008  H0      =      .28
zle/port arrangement:   unidirectional without fanning
MA =      90.00  THETA =      45.00  SIGMA   =      .00  BETA    =     90.00
   =       .208  Q0    =       .013          = .1310E-01
0  =  996.3187   DRHO0 = .3381E+01   GP0     = .3317E-01
   = .1000E+04   CUNITS=  PPB
LL =  1          KS    = .0000E+00   KD      = .0000E+00

 VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
   = .1074E-02  m0     = .2239E-03   j0      = .3561E-04  SIGNJ0=      1.0
sociated 2-d length scales (meters)
B  =       .005  lM    =        .21  lm      =       .01
)  =   99999.00  lbp   =   99999.00  la      =   99999.00

 VARIABLES - ENTIRE DIFFUSER (metric units)
   = .1310E-01  M0     = .2731E-02   J0      = .4345E-03
sociated 3-d length scales (meters)
                                      Lm     =       .35  Lb      =       .13
   =        .25  LM    =        .57   Lmp    =  99999.00  Lbp     =  99999.00
                                                   4.033  Lmin    =      .174
dal:             Tu    =     .0864 h  Lu     =

-DIMENSIONAL PARAMETERS
0  =      15.95  FRD0  =       3.62   R      =      1.38
lot)             (port/nozzle)

W CLASSIFICATION
2222222222222222222222222222222222222222
 Flow class (CORMIX2)         =    MU2    2
 Applicable layer depth HS =      1.52    2
2222222222222222222222222222222222222222

ING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
```

= .1000E+04 CUNITS= PPB
= 0
= 0
Z = 0
= 6000.00 XMAX = 6000.00

COORDINATE SYSTEM:
RIGIN is located at the bottom and the diffuser mid-point:
12.20 m from the LEFT bank/shore.
-axis points downstream, Y-axis points to left, Z-axis points upward.
= 10 display intervals per module

MOD201: DIFFUSER DISCHARGE MODULE

to complex near-field motions: EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

ile definitions:
= Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
= top-hat half-width, in horizontal plane normal to trajectory
= hydrodynamic centerline dilution
= centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.28	1.0	.100E+04	.00	6.10

OF MOD201: DIFFUSER DISCHARGE MODULE

MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER

his laterally contracting zone the diffuser plume becomes VERTICALLY FULLY
ED over the entire layer depth (HS = 1.52m).
ll mixing is achieved after a plume distance of about five
ayer depths from the diffuser.

file definitions:
= layer depth (vertically mixed)
= top-hat half-width, in horizontal plane normal to trajectory
= hydrodynamic average (bulk) dilution
= average (bulk) concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	.28	1.0	.100E+04	.00	6.10
.61	.00	.33	67.6	.148E+02	.15	6.09
1.22	.00	.38	94.5	.106E+02	.30	6.09
1.83	.00	.42	114.6	.873E+01	.46	6.09
2.44	.00	.47	131.1	.763E+01	.61	6.09
3.05	.00	.52	145.3	.688E+01	.76	6.08
3.66	.00	.57	157.9	.633E+01	.91	6.08
4.27	.00	.62	169.3	.591E+01	1.07	6.08
4.88	.00	.67	179.6	.557E+01	1.22	6.08
5.49	.00	.71	189.1	.529E+01	1.37	6.08
6.10	.00	.76	197.9	.505E+01	1.52	6.08

ulative travel time = 40. sec

OF MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER

MOD251: DIFFUSER PLUME IN CO-FLOW

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Omega Fact Sheet
Attachment 9

e 1: Vertically mixed, Phase 2: Re-stratified

---

e 2: The flow has RESTRATIFIED at the beginning of this zone.

flow region is INSIGNIFICANT in spatial extent and will be by-passed.

F MOD251: DIFFUSER PLUME IN CO-FLOW

---

d of NEAR-FIELD REGION (NFR) **

I MOD241: BUOYANT AMBIENT SPREADING

harge is non-buoyant or weakly buoyant.
ierefore BUOYANT SPREADING REGIME is ABSENT.

)F MOD241: BUOYANT AMBIENT SPREADING

N MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

rtical diffusivity (initial value) = .935E-02 m^2/s
rizontal diffusivity (initial value) = .117E-01 m^2/s

passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

file definitions:
V = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
= or equal to layer depth, if fully mixed
H = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
measured horizontally in Y-direction
U = upper plume boundary (Z-coordinate)
L = lower plume boundary (Z-coordinate)
= hydrodynamic centerline dilution
= centerline concentration (includes reaction effects, if any)

me Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
6.10	.00	1.52	197.9	.505E+01	1.52	6.12	1.52	.00
51.64	.00	1.52	171.2	.584E+01	1.52	6.97	1.52	.00
97.17	.00	1.52	180.0	.555E+01	1.52	7.73	1.52	.00
142.71	.00	1.52	201.2	.497E+01	1.52	8.42	1.52	.00
188.24	.00	1.52	228.7	.437E+01	1.52	9.05	1.52	.00
210.07	.00	1.52	243.4	.412E+01	1.52	9.34	1.52	.00

mulative travel time = 1400. sec

RMIX prediction has been TERMINATED at last prediction interval.
Limiting distance due to TIDAL REVERSAL has been reached.

OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

MIX2: Submerged Multiport Diffuser Discharges End of Prediction File
22222222222222222222222222222222222222222222222222222222222222

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```
:X2 PREDICTION FILE:
:2222222222222222222222222222222222222222222222222222222222222222222222222
                    CORNELL MIXING ZONE EXPERT SYSTEM
/stem CORMIX2:                                              Subsystem-version:
nerged Multiport Diffuser Discharges     CORMIX v.3.20      September 1996
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
 DESCRIPTION
e name/label:          ZAPATA^VA0003867
ign case:              SLACK^-^LONG^DIFFUSER
E NAME:                cormix\sim\ZAPATA5 .cx2
e of Fortran run:      09/16/98--15:24:46

RONMENT PARAMETERS (metric units)
nded section
   =    503.00  AS    =    766.57  QA    =       .00  ICHREG= 1
   =      1.52  HD    =      1.52
al Simulation at TIME =       .000 h
IOD=     12.40 h UAmax =       .300 dUa/dt=       .150 (m/s)/h
   =       .000 F     =       .334 USTAR = .0000E+00
   =      2.000 UWSTAR= .2198E-02
form density environment
CND=  U         RHOAM =  999.7000

USER DISCHARGE PARAMETERS (metric units)
fuser type:     DITYPE= unidirectional perpendicular
IK  =  LEFT     DISTB =     12.20  YB1   =      6.10  YB2   =     18.30
   =     12.20  NOPEN =    8       SPAC  =      1.74
   =      .100  A0    =       .008 H0    =       .28
:zle/port arrangement:   unidirectional without fanning
IMA =     90.00  THETA =     45.00  SIGMA =       .00  BETA  =     90.00
   =      .208  Q0    =       .013       = .1310E-01
)0  =  996.3187  DRHO0 = .3381E+01  GP0   = .3317E-01
   = .1000E+04  CUNITS=  PPB
)LL =  1        KS    = .0000E+00  KD    = .0000E+00

( VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
   = .1074E-02  m0    = .2239E-03  j0    = .3561E-04  SIGNJ0=      1.0
sociated 2-d length scales (meters)
=B  =      .005 lM    =       .21  lm    =  99999.00
>   =  99999.00  lbp   =  99999.00  la    =  99999.00

K VARIABLES - ENTIRE DIFFUSER (metric units)
   = .1310E-01  M0    = .2731E-02  J0    = .4345E-03
sociated 3-d length scales (meters)
   =      .25  LM    =       .57  Lm    =  99999.00  Lb    =  99999.00
                                  Lmp   =  99999.00  Lbp   =  99999.00
dal:            Tu    =    .0864 h Lu    =     4.033 Lmin  =       .174

-DIMENSIONAL PARAMETERS
0   =     15.95  FRD0  =      3.62  R     =  99999.00
lot)           (port/nozzle)

W CLASSIFICATION
22222222222222222222222222222222222222
 Flow class (CORMIX2)       =    MU1V   2
 Applicable layer depth HS  =     1.52  2
22222222222222222222222222222222222222

ING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
```

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```
   = .1000E+04  CUNITS-  PPB
   =  0
   =  0
 Z =  0
   =  6000.00  XMAX  =  6000.00

  COORDINATE SYSTEM:
 RIGIN is located at the bottom and the diffuser mid-point:
    12.20 m  from the LEFT  bank/shore.
 -axis points downstream, Y-axis points to left, Z-axis points upward.
  = 10 display intervals per module
 ------------------------------------------------------------------------
 ------------------------------------------------------------------------
 I MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)

   X          Y         Z        S        C         BV        BH
  .00        .00       .28      1.0   .100E+04     .05       .05

 )F MOD101: DISCHARGE MODULE (SINGLE PORT AT DIFFUSER CENTER)
 ------------------------------------------------------------------------
 ------------------------------------------------------------------------
 I CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION

 /plume transition motion in weak crossflow.

 e of flow establishment:             THETAE=    45.00  SIGMAE=        .00
    =        .00  XE    =        .00  YE    =      .00  ZE    =        .28

 file definitions:
 V = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
 H = before merging: Gaussian 1/e (37%) half-width in horizontal plane
                     normal to trajectory
     after merging:  top-hat half-width in horizontal plane
                     parallel to diffuser line
   = hydrodynamic centerline dilution
   = centerline concentration (includes reaction effects, if any)

   X          Y         Z        S        C         BV        BH
 dividual jet/plumes before merging:
   .00       .00       .28      1.0   .100E+04     .05       .05
   .08       .00       .37      1.1   .900E+03     .06       .06
   .15       .00       .46      1.4   .703E+03     .08       .08
   .21       .00       .57      1.8   .566E+03     .09       .09
   .26       .00       .67      2.2   .465E+03     .10       .10
   .31       .00       .78      2.6   .390E+03     .11       .11
   .35       .00       .89      3.0   .331E+03     .12       .12
   .39       .00      1.01      3.5   .286E+03     .14       .14
   .42       .00      1.12      4.0   .249E+03     .15       .15
   .45       .00      1.24      4.6   .220E+03     .16       .16
   .48       .00      1.35      5.1   .195E+03     .17       .17
 ulative travel time =         6. sec
 rging of individual jet/plumes not found in this module, but interaction
 will occur in following module.  Overall jet/plume interaction dimensions:
   .48       .00      1.35      5.1   .195E+03     .17      6.15

 OF CORJET (MOD110): JET/PLUME NEAR-FIELD MIXING REGION
 ------------------------------------------------------------------------
 ------------------------------------------------------------------------
 N MOD232: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING
```

tical angle of layer/boundary impingement = 77.35 deg
izontal angle of layer/boundary impingement = .00 deg

charge into STAGNANT AMBIENT environment:
STEADY-STATE MIXING CONDITION IS NOT POSSIBLE in this zone,
even though some ADDITIONAL DILUTION MAY OCCUR!
lso, all far-field processes will be UNSTEADY.
IULATION STOPS because of stagnant ambient conditions.

)F MOD232: LAYER BOUNDARY IMPINGEMENT/UPSTREAM SPREADING

ıd of NEAR-FIELD REGION (NFR) **

JLATION STOPS because of STAGNANT AMBIENT conditions.
.l far-field processes will be UNSTEADY.

:X2: Submerged Multiport Diffuser Discharges End of Prediction File
:22222222222222222222222222222222222222222222222222222222222222222222222

```
:X2 PREDICTION FILE:
:2222222222222222222222222222222222222222222222222222222222222222
                    CORNELL MIXING ZONE EXPERT SYSTEM
/stem CORMIX2:                                          Subsystem version:
nerged Multiport Diffuser Discharges    CORMIX v.3.20     September 1996
-------------------------------------------------------------------------
-------------------------------------------------------------------------
 DESCRIPTION
e name/label:          ZAPATA^VA0003867
ign case:              BEFORE^SLACK^-^LONG^DIFFUSER
E NAME:                cormix\sim\ZAPATA6 .cx2
e of Fortran run:      09/16/98--15:26:42

RONMENT PARAMETERS (metric units)
nded section
   =    503.00  AS    =    766.57  QA    =    114.99  ICHREG= 1
   =      1.52  HD    =      1.52
al Simulation at TIME =     -1.000 h
IOD=    12.40 h UAmax =       .300 dUa/dt=       .150 (m/s)/h
   =       .150 F     =       .334 USTAR = .3065E-01
   =     2.000 UWSTAR= .2198E-02
form density environment
CND=  U         RHOAM =  999.7000

USER DISCHARGE PARAMETERS (metric units)
fuser type:     DITYPE= unidirectional perpendicular
K  =  LEFT      DISTB =     12.20  YB1   =      6.10  YB2   =     18.30
   =     12.20  NOPEN =     8      SPAC  =      1.74
   =      .100  A0    =      .008  H0    =       .28
zle/port arrangement:   unidirectional without fanning
MA =     90.00  THETA =     45.00  SIGMA =       .00  BETA  =     90.00
   =      .208  Q0    =      .013        = .1310E-01
0  =  996.3187  DRHO0 = .3381E+01  GP0   = .3317E-01
   = .1000E+04  CUNITS=  PPB
LL =  1         KS    = .0000E+00  KD    = .0000E+00

 VARIABLES - PER UNIT DIFFUSER LENGTH (metric units)
   = .1074E-02  m0    = .2239E-03  j0    = .3561E-04  SIGNJ0=      1.0
ociated 2-d length scales (meters)
B  =      .005  lM    =       .21  lm    =       .01
   =  99999.00  lbp   =  99999.00  la    =  99999.00

 VARIABLES - ENTIRE DIFFUSER (metric units)
   = .1310E-01  M0    = .2731E-02  J0    = .4345E-03
ociated 3-d length scales (meters)
   =      .25   LM    =       .57  Lm    =       .35  Lb    =       .13
                                   Lmp   =  99999.00  Lbp   =  99999.00
al:              Tu    =    .0864 h Lu    =     4.033 Lmin  =      .174

DIMENSIONAL PARAMETERS
   =     15.95  FRD0  =      3.62  R     =      1.38
ot)              (port/nozzle)

 CLASSIFICATION
:2222222222222222222222222222222222222
Flow class (CORMIX2)       =    MU2    2
Applicable layer depth HS =     1.52  2
:2222222222222222222222222222222222222

:NG ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
```

Attach-ment 9 23/24

```
   = .1000E+04  CUNITS=  PPB
   = 0
   = 0
IZ = 0
   =   6000.00  XMAX =   6000.00

Z COORDINATE SYSTEM:
ORIGIN is located at the bottom and the diffuser mid-point:
    12.20 m  from the LEFT  bank/shore.
X-axis points downstream, Y-axis points to left, Z-axis points upward.
P = 10 display intervals per module
-------------------------------------------------------------------------
-------------------------------------------------------------------------
N MOD201: DIFFUSER DISCHARGE MODULE

 to complex near-field motions:  EQUIVALENT SLOT DIFFUSER (2-D) GEOMETRY

file definitions:
V = Gaussian 1/e (37%) half-width, in vertical plane normal to trajectory
H = top-hat half-width, in horizontal plane normal to trajectory
  = hydrodynamic centerline dilution
  = centerline concentration (includes reaction effects, if any)

    X        Y        Z        S        C        BV       BH
   .00      .00      .28      1.0  .100E+04     .00     6.10

 OF MOD201: DIFFUSER DISCHARGE MODULE
-------------------------------------------------------------------------
-------------------------------------------------------------------------
IN MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER

 this laterally contracting zone the diffuser plume becomes VERTICALLY FULLY
IXED over the entire layer depth (HS =    1.52m).
Full mixing is achieved after a plume distance of about five
layer depths from the diffuser.

ofile definitions:
BV = layer depth (vertically mixed)
BH = top-hat half-width, in horizontal plane normal to trajectory
S  = hydrodynamic average (bulk) dilution
C  = average (bulk) concentration (includes reaction effects, if any)

    X        Y        Z        S        C        BV       BH
   .00      .00      .28      1.0  .100E+04     .00     6.10
   .61      .00      .33     68.1  .147E+02     .15     6.09
  1.22      .00      .38     95.8  .104E+02     .30     6.09
  1.83      .00      .42    116.9  .855E+01     .46     6.09
  2.44      .00      .47    134.7  .742E+01     .61     6.09
  3.05      .00      .52    150.3  .665E+01     .76     6.08
  3.66      .00      .57    164.3  .609E+01     .91     6.08
  4.27      .00      .62    177.2  .564E+01    1.07     6.08
  4.88      .00      .67    189.1  .529E+01    1.22     6.08
  5.49      .00      .71    200.3  .499E+01    1.37     6.08
  6.10      .00      .76    210.8  .474E+01    1.52     6.08
umulative travel time =          40. sec

D OF MOD271: ACCELERATION ZONE OF UNIDIRECTIONAL CO-FLOWING DIFFUSER
-------------------------------------------------------------------------
-------------------------------------------------------------------------
GIN MOD251: DIFFUSER PLUME IN CO-FLOW
```

se 1: Vertically mixed, Phase 2: Re-stratified

---

se 2: The flow has RESTRATIFIED at the beginning of this zone.

s flow region is INSIGNIFICANT in spatial extent and will be by-passed.

OF MOD251: DIFFUSER PLUME IN CO-FLOW

---

nd of NEAR-FIELD REGION (NFR) **

N MOD241: BUOYANT AMBIENT SPREADING

charge is non-buoyant or weakly buoyant.
herefore BUOYANT SPREADING REGIME is ABSENT.

OF MOD241: BUOYANT AMBIENT SPREADING

N MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

rtical diffusivity (initial value) = .935E-02 m^2/s
rizontal diffusivity (initial value) = .117E-01 m^2/s

passive diffusion plume is VERTICALLY FULLY MIXED at beginning of region.

file definitions:
BV = Gaussian s.d.*sqrt(pi/2) (46%) thickness, measured vertically
= or equal to layer depth, if fully mixed
BH = Gaussian s.d.*sqrt(pi/2) (46%) half-width,
measured horizontally in Y-direction
ZU = upper plume boundary (Z-coordinate)
ZL = lower plume boundary (Z-coordinate)
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

ume Stage 1 (not bank attached):

X	Y	Z	S	C	BV	BH	ZU	ZL
6.10	.00	1.52	210.8	.474E+01	1.52	6.12	1.52	.00
51.64	.00	1.52	227.8	.439E+01	1.52	6.97	1.52	.00
97.17	.00	1.52	249.6	.401E+01	1.52	7.73	1.52	.00
142.71	.00	1.52	273.5	.366E+01	1.52	8.42	1.52	.00
188.24	.00	1.52	297.7	.336E+01	1.52	9.05	1.52	.00
233.78	.00	1.52	321.4	.311E+01	1.52	9.65	1.52	.00
238.07	.00	1.52	323.5	.309E+01	1.52	9.70	1.52	.00

mulative travel time = 1587. sec

RMIX prediction has been TERMINATED at last prediction interval.
Limiting distance due to TIDAL REVERSAL has been reached.

OF MOD261: PASSIVE AMBIENT MIXING IN UNIFORM AMBIENT

MIX2: Submerged Multiport Diffuser Discharges End of Prediction File
22222222222222222222222222222222222222222222222222222222222222222222222222

Attachment 9

Jon VanSoestbergen@RCHMD@DEQ

: Maynard D. Phillips@WPS@DEQ
ect:
: Monday, September 28, 1998 8:45:07 EDT
ch:
ify: N
arded by: Jon VanSoestbergen@RCHMD@DEQ

---

arded to: Denise M. Mosca@KLMCK@DEQ
cc: Maynard D. Phillips@WPS@DEQ
arded date: Monday, September 28, 1998 10:23:12 EDT
ents by: Jon VanSoestbergen@RCHMD@DEQ
ents:

se:

lowing are Dale's comments regarding my 9/17/1998 memo and work on the ita wasteload allocation review and CORMIX analysis. If you include this ail as part of the file I don't see any reason to rewrite my 9/17/1998 . Could you please make a copy of the 9/17/1998 memo and attachment (24 es) and send it to me. I forgot to make a copy before I gave you the cage when you were here last week.

address Dale's comments/questions:

e's explanation as to why the long diffuser is better should be adequate umentation regarding this issue.

circular mixing zone I describe in my 9/17/1998 is as measured from the point of the diffuser. CORMIX defines the origin of the coordinate (x-y-plane as this point. S (the hydrodynamic centerline dilution) is then as sured from this origin. Therefore, I believe my definition of the mixing e as a circle measured around the diffuser midpoint is not incorrect. ever, describing the mixing zone as extending from the diffuser in any ection is also acceptable, and would have the effect only of extending the ndary slightly further out in the y-direction toward the middle of the eam, in theory resulting in a slightly larger mixing zone. Practically, ugh, the difference between the two is of the order of 10 feet in the y-ection, which in the context of water quality monitoring and model uracy is negligible. In any event, the final defined mixing zone will be unction of the final diffuser design submitted by Zapata. You should vide this final design to me for analysis when it is received, unless some t of mixing zone analysis is provided as documentation with the design.

ill consider this e-mail as finalizing my 9/17/1998 memorandum and my work this project. If you have any questions or need additional information, ase don't hesitate to call me.

1.

Attachment 9

Maynard D. Phillips@WPS@DEQ
Denise M. Mosca@KLMCK@DEQ
Curtis J. Linderman@RCHMD@DEQ

Jon VanSoestbergen@RCHMD@DEQ
ect: Zapata CORMIX analysis
: Thursday, September 17, 1998 9:34:00 EDT
ch:
ify: N
arded by:

:

n sending you the results of the CORMIX analysis I did for Zapata today. ave not yet sent the information to Denise pending your review. Please me know if you have any concerns with the analysis. I will wait to send package to Denise until I hear from you one way or the other.

summary, I ended up analyzing two different diffuser designs. The first roximates the design that was included in the package provided by Denise, the second is a design of my own. The first ("short diffuser") results a dilution ratio of 50:1. The second ("long diffuser") results in a ution ration of 100:1. The mixing zone for the first is 25 feet, for the ond, 20 feet. The ratio used by the permit writer will depend on the al diffuser design selected by the permittee.

we discussed yesterday, I analyzed each design 1 hr before slack tide, at ck tide, and 1 hr after slack tide. Then I averaged the most conservative results for each diffuser to obtain the final dilution ratio. This ults in a dilution ratio based on a 1-hr average flow under critical ditions, which best reflects the way the acute standard is written. My ommendation is that the selected dilution ratio be used for both acute and onic WLA determination.

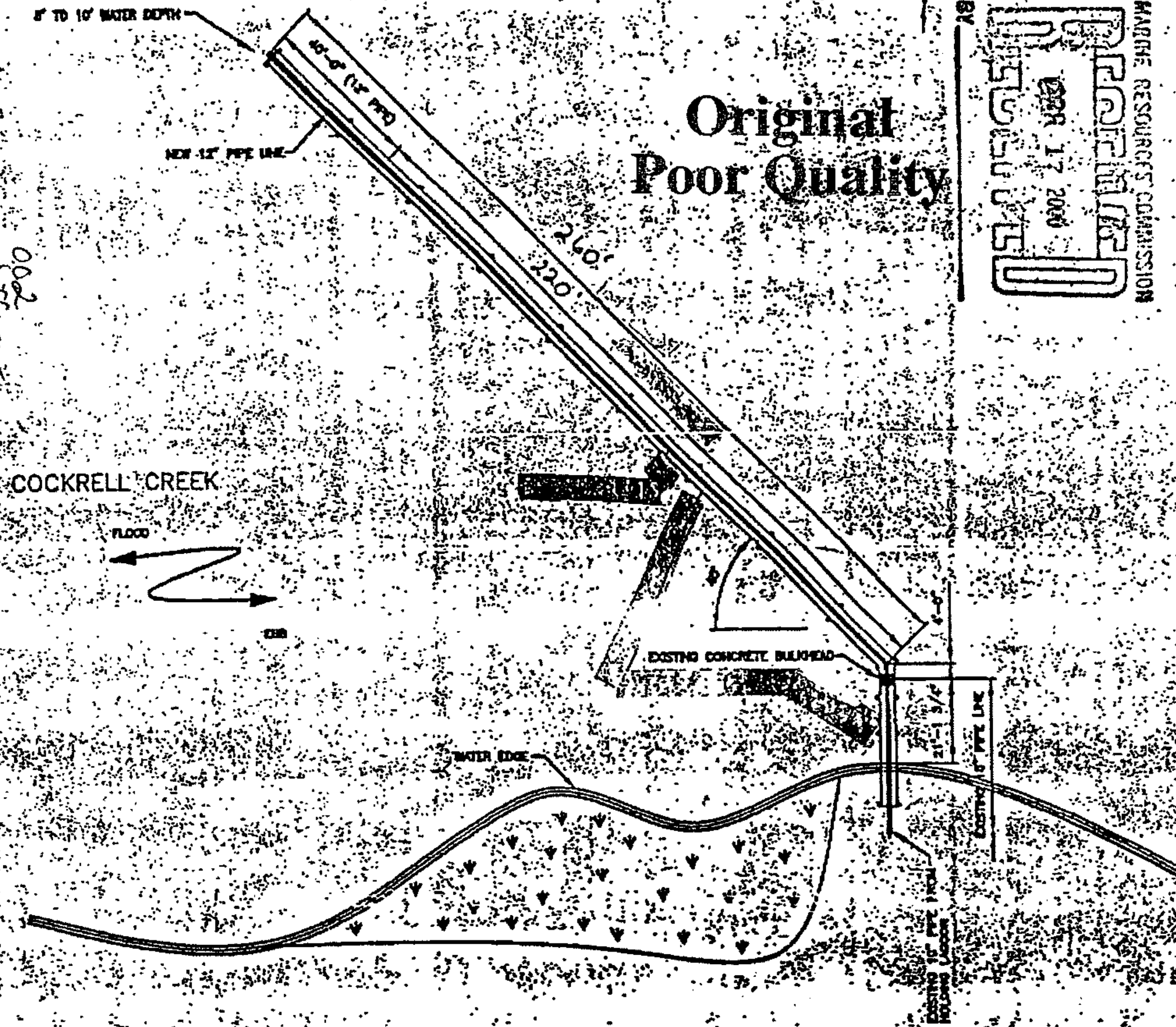
nks for your help on this.

CROSS SECTION VIEW ---
Omega Protein
Shown without walkway
NOT to scale

04/17/00 07:45 OMEGA PROTEIN 002/003

ADDITIONAL INFO REVISION

Original Poor Quality



PLAN VIEW

SCALE 1"=40'-0"

Omega Protein Attachment

BEST ENGINEERING JUDGMENT BASED ON TECHNOLOGY BASED LIMITATION CALCULATIONS

EPA promulgated Effluent Limitation Guidelines (ELG) for fish meal processing facilities.

Technology Limitation calculations – based on ELG and production reported on Form 2C. 4.0 Million lbs/d (1,814,369 kg/d).
Technology Limitations = (Production * Multiplier)/1000

Outfall 002

		Multiplier (kg/1000 kg)	Calculated Limit (kg/d)
BOD_5	**Avg**	3.9	7100
	Max	7	13000
TSS	**Avg**	1.5	2700
	Max	3.7	6700
O&G	**Avg**	0.76	1400
	Max	1.4	2500

WATER QUALITY BASED LIMITATION (WQBL) CACULATIONS

The 1976 VIMS model reported that loading to Cockrell Creek cannot exceed 5000 lb/d of $cBOD_5$ in order to protect water quality of the creek. The two menhaden plants (Zapata and Ampro, now merged as Omega) were allocated 4900 lb/day (2222.22 kg/d) of $cBOD_5$. In order to calculate WQBL, it is necessary to assume that all $cBOD_5$ is equal to BOD_5. Because cBOD is only one component of the total oxygen demanding process, this would reflect a conservative limiting assumption regarding $cBOD_5$ loading. This is necessary because the ELG provide production based effluent emission factors in terms of BOD_5 and ratios from the ELG were used in the derivation of WQBL for TSS and Oil and Grease. Also it is necessary to perform WQBL calculation in terms of BOD_5 for purposes of comparison to the technology derived limitations to determine the more restrictive of technology based limitation or water quality based limitations.

ELG Multipliers (kg/ 1000 kg)

	Average	Maximum
BOD_5	3.9	7.0
TSS	1.5	3.7
O&G	0.76	1.4

The VIMS WLA of BOD_5 was used in calculation of maximum loading limitations. The ELG ratio of max BOD multiplier (7) to average BOD_5 multiplier (3.9) was calculated and multiplied by the average BOD_5 WLA to calculate a maximum BOD_5 WLA.

4900 lb/d* (7/3.9) = 8794.872 lb/d max WLA based on VIMS model WLA

To calculate loading limitations of TSS and Oil and Grease to determine WQBL, the BOD_5 WLA was multiplied by the ratio of multipliers from the ELG of TSS to BOD_5 and Oil and Grease to BOD_5:

TSS Average: 4900 lb/d * (1.5 TSS/3.9 BOD_5) / 2.205 kg/lb = 854.7009 kg/d
TSS Maximum: 8794.872 lb/d* (3.7 TSS/7.0 BOD_5)/2.205 kg/lb = 2108.262 kg/d
O&G Average: 4900 lb/d * (0.76 O&G/3.9 BOD_5) / 2.205 kg/lb = 433.0484 kg/d O&G
O&G Maximum: 8794.872 lb/d * (1.4 O&G/7.0 BOD_5) / 2.205 kg/lb = 797.7208 kg/d O&G

Comparison and Limitation Determination (kg/d)

		BPJ	WQBL	Previous Permit Limits*
BOD_5	Mo. Avg	7100	2200	470
	Max	13000	8800	840
TSS	Mo. Avg	2700	850	160
	Max	6700	2100	410
O&G	Mo. Avg	1400	430	25
	Max	2500	800	46

* See attached documentation showing how previous permit limitations were calculated.

The previous permit limitations were calculated using similar methods to the WQBL calculation as described above. At the time that those limitations were calculated the facility discharged wastewater from Outfall 001 (contact cooling water) and limitations were based on proportions of loading from Outfall 001 and Outfall 002.

Based on the anti-backsliding policy (9 VAC 25-31-220 L), permits may not be renewed, reissued or modified to contain effluent limitations which are less stringent than the comparable effluent limits in the previous permit with some exceptions including material and substantial alterations at the facility. The elimination of Outfall 001 is not considered a material and substantial alteration to the treatment train at Outfall 002 and is not related to the ability to achieve water quality performance levels previously demonstrated at Outfall 002. Therefore, the limitations for BOD_5, TSS, and O&G contained in the previous permit will be carried forward with this permit renewal with a basis of best professional judgment. Explanation of the previous permit limitation is attached.

HOWEVER, WQS DICTATE TOTAL ALLOWABLE BOD DISCHARGE TO CREEK IS 4911 LB/DAY AFTER THE WLA FOR THE REEDVILLE WWTP HAS BEEN SUBTRACTED. FRED CUNNINGHAM'S FACT SHEET DATED 8/29/84 ALLOWED A TOTAL OF 2223 KG/D. THIS HAS BEEN ALLOCATED IN ITS ENTIRETY TO OMEGA PROTEIN WITH THE 1997 PERMIT MODIFICATION.

THEREFORE THE SUM OF BOD FOR 001 AND 002, THE TWO PROCESS OUTFALLS DISCHARGING TO CREEK, CANNOT EXCEED 2223 KG/D, AND WQS LIMITS APPLY TO THESE 2 OUTFALLS. 003 IS LIMITED BY TECHNOLOGY LIMITS.

		Kg/d Total Wasteload Allocation 001+002 (from previous permit)	Scrubber 001 ~~6~~ 3.037 MGD		Lagoon 002 ~~0.26~~ 0.25 MGD	
BOD5	Avg	2223	001 BOD Loading/Total Loading = ~~0.7906~~ 160/182.2 = 0.8782	~~2223 x .7906 = 1756~~ 2222 x .8782 = 1952.24 use 1755/rounded to 1700 Kg/d	002 BOD Loading/Total Loading = ~~0.2494~~ 22.2/182.2 = 0.1218	~~468~~ 2223 x .1218 = 270.76 use 468, rounded to 470 Kg/d
Total BOD Loading* = ~~698 + 186 = 884~~ 160 + 22.2 = 182.2 kg/d	Max	3979		~~3979 x .7906 = 3142~~ 3979 x .8782 = 3494.38 use 3142 rounded to 3100		~~837~~ 3989 x .1218 = 485.66 use 837, rounded to 840
TSS	Avg	826	001 TSS Loading/Total Loading = ~~0.7924~~ 199/249.8 = .7966	~~826 x .7924 = 655~~ 826 x .7966 = 657.99 use 655, rounded to 650	002 TSS Loading/Total Loading = ~~0.2076~~ 50.8/249.8 = 0.0234	~~171~~ 826 x .2034 = 168 use 168, rounded to 160
Total TSS Loading* = ~~416 + 109 = 525~~ 199+50.8= 249.8 kg/d	Max	2031		~~1609~~ 2031 x .7966 = 1617.69 use 1609, rounded to 1600		~~422~~ 2031 x .2034 = 413.11 use 413, rounded to 410
O&G	Avg	400	001 O&G Loading/Total Loading = ~~0.9369~~ 54.3/57.9 = .9378	~~373~~ 400 x .9378 = 375 use 372, rounded to 370	002 O&G Loading/Total Loading = ~~0.0631~~ 3.6/57.9 = .0622	~~27.6~~ 400 x .0622 = 24.88 use 24.9, rounded to 25
Total O&G Loading* = ~~101 + 7.5 = 108.5~~ 54.3 + 3.6 = 57.9 Kg/d	Max	736		~~685~~ 736 x .9378 = 690 use 685, rounded to 680		~~50.9~~ 736 x .0622 = 45.76 use 45.8, rounded to 46

Environment & Safety Library

Federal Environment and Safety Codified Regulations
TITLE 40—Protection of Environment
PART 408—CANNED AND PRESERVED SEAFOOD PROCESSING POINT SOURCE CATEGORY

SUBPART O—Fish Meal Processing Subcategory

Source: 40 FR 55781, Dec. 1, 1975, unless otherwise noted.

§ 408.150 Applicability; description of the fish meal processing subcategory.

The provisions of this subpart are applicable to discharges resulting from the processing of menhaden on the Gulf and Atlantic Coasts and the processing of anchovy on the West Coast into fish meal, oil and solubles.

§ 408.151 Specialized definitions.

For the purpose of this subpart:

408.151(a)

Except as provided below, the general definitions, abbreviations and methods of analysis set forth in part 401 of this chapter shall apply to this subpart.

408.151(b)

The term *seafood* shall mean the raw material, including freshwater and saltwater fish and shellfish, to be processed, in the form in which it is received at the processing plant.

§ 408.152 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

Except as provided in §§125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

408.152(a)

Any menhaden or anchovy fish meal reduction facility which utilizes a solubles plant to process stick water or bail water shall meet the following limitations.

Effluent characteristic	Effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed—
	Metric units (kilograms per 1,000 kg of seafood)	
BOD *5*	7.0	3.9
TSS	3.7	1.5
Oil and grease	1.4	0.76
pH	([1])	([1])
	English units (pounds per 1,000 lb of seafood)	
BOD *5*	7.0	3.9
TSS	3.7	1.5
Oil and grease	1.4	0.76
pH	([1])	([1])

[1] Within the range 6.0 to 9.0.

408.152(b)

Any menhaden or anchovy fish meal reduction facility not covered under §408.152(a) shall meet the following limitations:

Effluent characteristic	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed—
	Metric units (kg/kkg of seafood)	
BOD 5	3.5	2.8
TSS	2.6	1.7
Oil and grease	3.2	1.4
pH	([1])	([1])
	English units (lb/1,000 lb of seafood)	
BOD 5	3.5	2.8
TSS	2.6	1.7
Oil and grease	3.2	1.4
pH	([1])	([1])

[1] Within the range 6.0 to 9.0.

[40 FR 55781, Dec. 1, 1975, as amended at 41 FR 31821, July 30, 1976; 60 FR 33943, June 29, 1995]

§ 408.153 [Reserved]

§ 408.154 Pretreatment standards for existing sources.

Any existing source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR part 403. In addition, the following pretreatment standard establishes the quantity or quality of pollutants or pollutant properties controlled by this section which may be discharged to a publicly owned treatment works by a point source subject to the provisions of this subpart.

Pollutant or pollutant property	Pretreatment standard
BOD 5	No limitation.
TSS	Do.
pH	Do.
Oil and grease	Do.

[40 FR 55781, Dec. 1, 1975, as amended at 60 FR 33943, June 29, 1995]

§ 408.155 Standards of performance for new sources.

The following standards of performance establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a new source subject to the provisions of this subpart:

Effluent characteristic	Effluent limitations: Maximum for any 1 day	Effluent limitations: Average of daily values for 30 consecutive days shall not exceed—
	Metric units (kilograms per 1,000 kg of seafood)	
BOD 5	6.7	3.8
TSS	3.7	1.5
Oil and grease	1.4	0.76
pH	([1])	([1])
	English units (pounds per 1,000 lb of seafood)	
BOD 5	6.7	3.8
TSS	3.7	1.5
Oil and grease	1.4	0.76
pH	([1])	([1])

[1] Within the range 6.0 to 9.0.

[40 FR 55781, Dec. 1, 1975, as amended at 41 FR 31821, July 30, 1976]

§ 408.156 Pretreatment standards for new sources.

Any new source subject to this subpart that introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR part 403. In addition, the following pretreatment standard establishes the quantity or quality of pollutants or pollutant properties controlled by this section which may be discharged to a publicly owned treatment works by a new source subject to the provisions of this subpart:

Pollutant or pollutant property	Pretreatment standard
BOD *5*	No limitation.
TSS	Do.
pH	Do.
Oil and grease	Do.

[40 FR 55781, Dec. 1, 1975, as amended at 60 FR 33944, June 29, 1995]

§ 408.157 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in §§125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in §401.16) in §408.152 of this subpart for the best practicable control technology currently available (BPT).

[51 FR 24997, July 9, 1986]

ISSN 1529-7918

Outfall 002 DMR Data

	Loading		Concentration		
Units (unless otherwise noted)	kg/d		mg/L		
	Avg	Max	Avg	Min	Max
FLOW (MGD)	0.33	0.567			
	0.096	0.262			
	0.145	0.372			
	0.135	0.276			
	0.128	0.219			
	0.104	0.275			
	0.094	0.17			
	0.078	0.119			
	0.221	0.356			
	0.232	0.278			
	0.139	0.244			
	0.158	0.301			
	0.132	0.202			
	0.122	0.246			
	0.118	0.205			
	0.148	0.201			
	0.177	0.245			
	0.151	0.224			
	0.161	0.226			
	0.141	0.294			
	0.142	0.296			
	0.106	0.188			
	0.066	0.108			
	0.153	0.179			
	0.203	0.364			
	0.177	0.272			
	0.177	0.367			
	0.161	0.258			
	0.147	0.209			
	0.124	0.254			
	0.172	0.388			
	0.15	0.346			
	0.122	0.218			
	0.116	0.211			
	0.09	0.14			
	0.09	0.206			
	0.07	0.17			
	0.078	0.1			
PH (S.U)				8.7	8.97
				7.49	8.29
				7.47	8.13
				7.4	8.16
				7.36	8.34
				7.62	8.55
				7.59	8.16
				79.5	8.5
				7.03	7.42
				7.68	8.18
				7.46	8.52
				7.5	8.5
				7.8	8.2
				7.6	8.5
				7.68	8.66

Average: 0.140894737 MGD
Maximum: 0.567 MGD

				8.25	8.42
				8.14	8.88
				7.68	8.42
				7.55	7.97
				7.51	8.02
				6.89	8.33
				7.46	8.53
				7.72	8.31
				6.57	6.79
				6.72	7.75
				6.5	7.65
				6.34	8.31
				6.12	7.97
				6.17	7.19
				6.25	7.1
				6.62	7.48
				6.76	8.22
				6.85	8.45
				6.55	7.87
				6.52	6.96
				6.6	7.49
				6.5	7
				6.9	7
BOD5	13.9	13.9			
	13.5	13.8			
	1.4	1.6			
	17.65	30.48			
	21.7	29.5			
	9.1	11.7			
	15.1	27.3			
	3.4	4.9			
	18.4	22.6			
	6.5	10.1			
	9.6	9.8			
	23.6	35.6			
	4.6	7.9			
	2.7	4.5			
	10.3	14.3			
	12.7	15.9			
	7.57	7.57			
	16	25			
	9.85	13.7			
	12.2	16.1			
	9.52	15.5			
	5.24	10.1			
	6.7	6.7			
	5.22	5.22			
	13	19.2			
	4.8	9.7			
	58.2	116.4			
	14.5	26.9			
	2.94	2.99			
	<QL	<QL			
	2.14	4.28			
	<3.1	6.2			
	3.34	4.59			
	10.5	19.2			

10th Percentile of Max: 7.07 S.U.

90th Percentile of Max: 8.536 S.U.

	0.965	1.93			
	0.749	1.5			
	1	2			
TSS	21.9	21.9			
	22	24.8			
	1.7	2.1			
	10.27	15.67			
	34	47.7			
	15.5	17.6			
	7.5	12.4			
	4.7	4.8			
	41.2	56.6			
	5.4	9.4			
	12	14.5			
	42.3	51.7			
	8.1	14.6			
	6.5	10.8			
	17.7	23.9			
	16.5	22.3			
	31.3	31.3			
	33.2	49.1			
	14.8	19.4			
	17.7	25.6			
	8.21	9.97			
	4.73	9.16			
	12.5	12.5			
	4.61	4.61			
	5.23	5.41			
	6.6	10.2			
	5.34	7.23			
	2.2	2.7			
	14.4	27.9			
	1.1	1.2			
	4.12	5.13			
	4.7	4.8			
	5.72	8.41			
	2.2	3.8			
	2.4	2.51			
	2.5	3			
	7	11			
COLIFORM, FECAL (N/100 mL)			144		
			424		
			757		
			518		
			443		
			702		
			219		
			15		
			162		
			1386		
			1426		
			1200		
			323		
			616		
			100		
			130		
			92		
			222		

			126		
			685		
			342		
			50		
			11		
			14		
			0.1		
			8.5		
			1		
			39		
			18		
			0		
			<2		
			<2		
			0		
			<2		
			<1		
			<QL		
PHOSPHORUS, TOTAL (AS P)	2.5		5.2		
	0.4		1.7		
	0.484		1.596		
	0.32		0.84		
	0.11		0.32		
	0.23		0.61		
	0.15		0.85		
	5.7		5.2		
	2.8		3.4		
	1.3		5.5		
	2.2		5		
	0.5		2		
	0.6		2.3		
	0.8		1.67		
	0.7		0.95		
	2.54		4.19		
	6.99		9.78		
	0.85		1.67		
	0.9		1.84		
	0.76		2.33		
	0.51		2.22		
	1.29		3.16		
	0.1		0.14		
	0.18		0.19		
	0.24		0.36		
	0.12		0.18		
	0.05		0.09		
	0.06		0.1		
	0.001		0.003		
	0.04		0.09		
	0.21		0.09		
	0.22		0.56		
	0.07		0.15		
	0.04		0.1		
	0.1		0.03		
	0.1		0.3		
NITROGEN, TOTAL (AS N)	4.8		13.2		
	6.3		22.4		
	45.01		126.4		
	44		102.2		

	12.7		30.6		
	8.72		21		
	4.75		27.4		
	15.6		14.5		
	18.8		22.9		
	6.8		28.2		
AMMONIA, AS N			1.2		1.3
			8.8		9.7
			89.1		125
			61.5		109
			8.97		12.9
			4.43		5.88
			3.7		6.2
			5.5		5.6
			14.9		17.5
			19.2		21.2
			7.4		8.4
			9		16.9
			1.6		2.2
			0.9		0.9
			2.6		4.93
			1.75		1.75
			8.95		15.6
			16.1		18.3
			1.6		1.7
			0.78		1.3
			0.74		1.47
			11.1		11.1
			0.97		0.97
			0.82		0.85
			1.9		3.38
			4.4		8.7
			14.1		15.6
			21		23.2
			34		37.8
			7.5		8.9
			11.6		13
			29.2		36.3
			23.8		24.4
			16.8		18.8
			22.3		28
			34		45
TKN (N-KJEL)	4.2		11.7		
	5.8		20.6		
	44.819		124.98		
	37.2		84.5		
	4.9		12.1		
	3.91		9.06		
	1.28		7.72		
	14.2		13.2		
	17.2		20.9		
	6.4		26		
TEMPERATURE, WATER (DEG. C)			4.41		4.7
			24.5		27.6
			27.5		30.4
			8.02		8.16
			22.6		25.2
			17.1		24

			14.2		15.3
			7.98		10.3
			21		22.8
			25		27.9
			27.1		31.2
			27.7		31.4
			24.8		27.7
			21.8		25.8
			13.8		17
			8.7		11.3
			28		29.4
			26.2		30.5
			26.8		30.3
			24.2		28.4
			20.5		23.3
			11.08		14.5
			8.52		10.2
			24.3		25.4
			26.4		28.5
			27.4		30.4
			29.8		31.9
			24.8		28.2
			18.8		25
			15.4		16.5
			23.1		27.1
			28.1		30.9
			29.1		31.3
			28.5		31.3
			25.3		29.7
			18.9		21.5
			14		15
			13		14.3
ENTEROCOCCI (N/100 mL)			189		
			440		
			2400		
			983.4		
			2420		
			2420		
			2420		
			31		
			200		
			331.7		
			1487		
			2420		
			496		
			229		
			119		
			>2420		
			>2420		
			1709		
			742		
			2420		
			2420		
			248		
			29		
			25		
			31.8		
			2.6		

90th Percentile of Max: 31.23 °C

			91.6		
			935		
			>2420		
			0		
			<10.8		
			<1		
			212		
			<1		
			7		
			2		
TOXICITY, FINAL, ACUTE (TUa)					1
					6.38
					<1
					<1.0
					<1.0
					<1.0
					<1.0
					<1.00
					<1.00
					<1.0
					<1.00
					<1.0
NITRITE+NITRATE-N,TOTAL	0.6		1.5		
	0.5		1.8		
	0.19		1.382		
	17.6		6.83		
	7.8		18.5		
	4.81		11.9		
	3.47		19.7		
	1.4		1.3		
	1.7		2		
	0.4		2.3		
OIL & GREASE	1.74	1.74			
	2.5	2.8			
	0.4	0.4			
	0.112	0.167			
	2.61	3.8			
	2.5	2.9			
	1.5	2			
	0.9	1.1			
	5.6	7.1			
	3.7	5.3			
	1.7	1.7			
	2	2.3			
	1.3	2.1			
	1.8	2.7			
	2.98	3.88			
	3.69	3.8			
	6.06	6.06			
	<QL	<QL			
	<QL	<QL			
	<QL	<QL			
	<QL	<QL			
	<QL	<QL			
	<QL	<QL			
	<QL	<QL			
	<QL	<QL			
	<QL	<QL			

	<QL	<QL			
	<QL	<QL			
	<10	<10			
	<10	<10			
	<5	<5			
	<5	<5			
	<5	<5			
	<1.5	<1.5			
	<5	<5			
	<QL	<QL			
	<QL	<QL			
NITROGEN, TOTAL (AS N) (MONTHLY LOAD) (kg/mo)		96.8			
		138.6			
		1170.2			
		704.6			
		330.7			
		48.1			
		47.5			
		NULL			
		46.9			
		320			
		190			
NITROGEN, TOTAL (AS N) (CALENDAR YEAR) (kg/yr)		2542			
PHOSPHORUS, TOTAL (AS P) (MONTHLY LOAD) (kg/mo)		50.8			
		9.4			
		12.1			
		5.12			
		0.11			
		2.34			
		1.5			
		17.1			
		47.9			
		37.4			
PHOSPHORUS, TOTAL (AS P) (CALENDAR YEAR) (kg/yr)		90.2			
ORTHOPHOSPHATE (AS P)	0.9		2.1		
	0.3		1.1		
	0.165		0.56		
	0.18		0.41		
	0.02		0.1		
	0.16		0.43		
	0.13		0.72		
	4.6		4.2		
	2.3		2.7		
	1.6		4.9		
NITROGEN, TOTAL (AS N) (YTD) (kg/yr)		50.4			
		50.4			
		50.4			
		50.4			
		147.2			
		285.8			
		1411			
		2115			

		2446			
		2494			
		2542			
		46.9			
		367.3			
		557.6			
PHOSPHORUS, TOTAL (AS P) (YTD) (kg/r)		6.1			
		6.1			
		6.1			
		6.1			
		56.9			
		66.3			
		78.4			
		83.5			
		86.4			
		88.7			
		90.2			
		17.1			
		65			
		102.4			

VA0003867 – Omega Protein Inc.

MSTRANTI DATA SOURCE REPORT FOR OUTFALL 002

Stream Information:	**Basis**
Mean Hardness	Not Applicable for Salt Water
90th% Temperature (Annual)	Ambient Data for Station 7-COC001.61
90th% Temperature (Winter)	No Tiered Limitations, Not Applicable
90th% Maximum pH	Ambient Data for Station 7-COC001.61
10th% Maximum pH	Ambient Data for Station 7-COC001.61
Tier Designation	Flow Frequency Memorandum
Mean Salinity	Ambient Data for Station 7-COC001.61
Mixing Information:	
Design Flow	Maximum 30 Day Value as Reported in Form 2C Application
Acute WLA Multiplier	Diffuser Model Documentation September 1998
Chronic WLA Multiplier	
Human Health WLA Multiplier	
Effluent Information:	
Mean Hardness	Not Applicable for Salt Water
90th% Temperature (Annual)	DMR Effluent Data
90th% Temperature (Winter)	No Tiered Limitations, Not Applicable
90th% Maximum pH	DMR Effluent Data
10th% Maximum pH	
Discharge Flow	Maximum 30 Day Value as Reported in Form 2C Application

SALTWATER AND TRANSITION ZONES
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Omega Protein Outfall 002 Permit No.: VA0003867 Version: OWP Guidance Memo 00-2011 (8/24/00)
Receiving Stream: Cockrells Creek

Stream Information		
Mean Hardness (as CaCO3) =	NA	mg/l
90th % Temperature (Annual) =	28.6	(° C)
90th % Temperature (Winter) =	NA	(° C)
90th % Maximum pH =	8.4	
10th % Maximum pH =	7.7	
Tier Designation (1 or 2) =	1	
Early Life Stages Present Y/N =	Y	
Tidal Zone =	1	(1 = saltwater, 2 = transition zone)
Mean Salinity =	16.2	(g/kg)

Mixing Information	
Design Flow (MGD)	0.265
Acute WLA multiplier	100
Chronic WLA multiplier	100
Human health WLA multiplier	100

Effluent Information		
Mean Hardness (as CaCO3) =	NA	mg/L
90 % Temperature (Annual) =	31.23	(° C)
90 % Temperature (Winter) =	NA	(° C)
90 % Maximum pH =	8.536	SU
10 % Maximum pH =	7.07	SU
Discharge Flow =	0.265	MGD

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			**Most Limiting Allocations**		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	**Acute**	**Chronic**	**HH**
Acenapthene	0	--	--	9.9E+02	--	--	9.9E+04	--	--	--	--	--	--	--	--	**9.9E+04**
Acrolein		--	--	9.3E+00	--	--	9.3E+02	--	--	--	--	--	--	--	--	**9.3E+02**
Acrylonitrile[C]		--	--	2.5E+00	--	--	2.5E+02	--	--	--	--	--	--	--	--	**2.5E+02**
Aldrin [C]	0	1.3E+00	--	5.0E-04	1.3E+02	--	5.0E-02	--	--	--	--	--	--	**1.3E+02**	--	**5.0E-02**
Ammonia-N (mg/l) - Annual	0	1.32E+00	1.99E-01	--	1.32E+02	1.99E+01	--	--	--	--	--	--	--	**1.32E+02**	**1.99E+01**	--
Ammonia-N (mg/l) - Winter	0	#VALUE!	#VALUE!	--	#VALUE!	#VALUE!	--	--	--	--	--	--	--	**#VALUE!**	**#VALUE!**	--
Anthracene	0	--	--	4.0E+04	--	--	4.0E+06	--	--	--	--	--	--	--	--	**4.0E+06**
Antimony	0	--	--	6.4E+02	--	--	6.4E+04	--	--	--	--	--	--	--	--	**6.4E+04**
Arsenic	0	6.9E+01	3.6E+01	--	6.9E+03	3.6E+03	--	--	--	--	--	--	--	**6.9E+03**	**3.6E+03**	--
Benzene [C]	0	--	--	5.1E+02	--	--	5.1E+04	--	--	--	--	--	--	--	--	**5.1E+04**
Benzidine[C]		--	--	2.0E-03	--	--	2.0E-01	--	--	--	--	--	--	--	--	**2.0E-01**
Benzo (a) anthracene [C]	0	--	--	1.8E-01	--	--	1.8E+01	--	--	--	--	--	--	--	--	**1.8E+01**
Benzo (b) fluoranthene [C]	0	--	--	1.8E-01	--	--	1.8E+01	--	--	--	--	--	--	--	--	**1.8E+01**
Benzo (k) fluoranthene [C]	0	--	--	1.8E-01	--	--	1.8E+01	--	--	--	--	--	--	--	--	**1.8E+01**
Benzo (a) pyrene [C]	0	--	--	1.8E-01	--	--	1.8E+01	--	--	--	--	--	--	--	--	**1.8E+01**
Bis2-Chloroethyl Ether[C]	0	--	--	5.3E+00	--	--	5.3E+02	--	--	--	--	--	--	--	--	**5.3E+02**
Bis2-Chloroisopropyl Ether	0	--	--	6.5E+04	--	--	6.5E+06	--	--	--	--	--	--	--	--	**6.5E+06**
Bis2-Ethylhexyl Phthalate[C]	0	--	--	2.2E+01	--	--	2.2E+03	--	--	--	--	--	--	--	--	**2.2E+03**
Bromoform [C]	0	--	--	1.4E+03	--	--	1.4E+05	--	--	--	--	--	--	--	--	**1.4E+05**
Butylbenzylphthalate	0	--	--	1.9E+03	--	--	1.9E+05	--	--	--	--	--	--	--	--	**1.9E+05**
Cadmium	0	4.0E+01	8.8E+00	--	4.0E+03	8.8E+02	--	--	--	--	--	--	--	**4.0E+03**	**8.8E+02**	--
Carbon Tetrachloride [C]	0	--	--	1.6E+01	--	--	1.6E+03	--	--	--	--	--	--	--	--	**1.6E+03**
Chlordane [C]	0	9.0E-02	4.0E-03	8.1E-03	9.0E+00	4.0E-01	8.1E-01	--	--	--	--	--	--	**9.0E+00**	**4.0E-01**	**8.1E-01**

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
TRC	0			--			--	--	--	--	--	--	--	--	--	--
Chlorine Prod. Oxidant	0	1.3E+01	7.5E+00	--	1.3E+03	7.5E+02	--	--	--	--	--	--	--	1.3E+03	7.5E+02	--
Chlorobenzene		--	--	1.6E+03	--	--	1.6E+05	--	--	--	--	--	--	--	--	1.6E+05
Chlorodibromomethane[C]	0	--	--	1.3E+02	--	--	1.3E+04	--	--	--	--	--	--	--	--	1.3E+04
Chloroform	0	--	--	1.1E+04	--	--	1.1E+06	--	--	--	--	--	--	--	--	1.1E+06
2-Chloronaphthalene	0	--	--	1.6E+03	--	--	1.6E+05	--	--	--	--	--	--	--	--	1.6E+05
2-Chlorophenol	0	--	--	1.5E+02	--	--	1.5E+04	--	--	--	--	--	--	--	--	1.5E+04
Chlorpyrifos	0	1.1E-02	5.6E-03	--	1.1E+00	5.6E-01	--	--	--	--	--	--	--	1.1E+00	5.6E-01	--
Chromium III	0			--			--	--	--	--	--	--	--	--	--	--
Chromium VI	0	1.1E+03	5.0E+01	--	1.1E+05	5.0E+03	--	--	--	--	--	--	--	1.1E+05	5.0E+03	--
Chrysene [C]	0	--	--	1.8E-02	--	--	1.8E+00	--	--	--	--	--	--	--	--	1.8E+00
Copper	0	9.3E+00	6.0E+00	--	9.3E+02	6.0E+02	--	--	--	--	--	--	--	9.3E+02	6.0E+02	--
Cyanide, Free	0	1.0E+00	1.0E+00	1.6E+04	1.0E+02	1.0E+02	1.6E+06	--	--	--	--	--	--	1.0E+02	1.0E+02	1.6E+06
DDD [C]	0	--	--	3.1E-03	--	--	3.1E-01	--	--	--	--	--	--	--	--	3.1E-01
DDE [C]	0	--	--	2.2E-03	--	--	2.2E-01	--	--	--	--	--	--	--	--	2.2E-01
DDT [C]	0	1.3E-01	1.0E-03	2.2E-03	1.3E+01	1.0E-01	2.2E-01	--	--	--	--	--	--	1.3E+01	1.0E-01	2.2E-01
Demeton	0	--	1.0E-01	--	--	1.0E+01	--	--	--	--	--	--	--	--	1.0E+01	--
Diazinon	0	8.2E-01	8.2E-01	--	8.2E+01	8.2E+01	--	--	--	--	--	--	--	8.2E+01	8.2E+01	--
Dibenz(a,h)anthracene [C]	0	--	--	1.8E-01	--	--	1.8E+01	--	--	--	--	--	--	--	--	1.8E+01
1,2-Dichlorobenzene	0	--	--	1.3E+03	--	--	1.3E+05	--	--	--	--	--	--	--	--	1.3E+05
1,3-Dichlorobenzene	0	--	--	9.6E+02	--	--	9.6E+04	--	--	--	--	--	--	--	--	9.6E+04
1,4-Dichlorobenzene	0	--	--	1.9E+02	--	--	1.9E+04	--	--	--	--	--	--	--	--	1.9E+04
3,3-Dichlorobenzidine[C]	0	--	--	2.8E-01	--	--	2.8E+01	--	--	--	--	--	--			
Dichlorobromomethane [C]	0	--	--	1.7E+02	--	--	1.7E+04	--	--	--	--	--	--	--	--	1.7E+04
1,2-Dichloroethane [C]	0	--	--	3.7E+02	--	--	3.7E+04	--	--	--	--	--	--	--	--	3.7E+04
1,1-Dichloroethylene	0	--	--	7.1E+03	--	--	7.1E+05	--	--	--	--	--	--	--	--	7.1E+05
1,2-trans-dichloroethylene	0	--	--	1.0E+04	--	--	1.0E+06	--	--	--	--	--	--	--	--	1.0E+06
2,4-Dichlorophenol	0	--	--	2.9E+02	--	--	2.9E+04	--	--	--	--	--	--	--	--	2.9E+04
1,2-Dichloropropane[C]	0	--	--	1.5E+02	--	--	1.5E+04	--	--	--	--	--	--	--	--	1.5E+04
1,3-Dichloropropene[C]	0	--	--	2.1E+02	--	--	2.1E+04	--	--	--	--	--	--	--	--	2.1E+04
Dieldrin [C]	0	7.1E-01	1.9E-03	5.4E-04	7.1E+01	1.9E-01	5.4E-02	--	--	--	--	--	--	7.1E+01	1.9E-01	5.4E-02
Diethyl Phthalate	0	--	--	4.4E+04	--	--	4.4E+06	--	--	--	--	--	--	--	--	4.4E+06
2,4-Dimethylphenol	0	--	--	8.5E+02	--	--	8.5E+04	--	--	--	--	--	--	--	--	8.5E+04
Dimethyl Phthalate	0	--	--	1.1E+06	--	--	1.1E+08	--	--	--	--	--	--	--	--	1.1E+08
Di-n-Butyl Phthalate	0	--	--	4.5E+03	--	--	4.5E+05	--	--	--	--	--	--	--	--	4.5E+05
2,4 Dinitrophenol	0	--	--	5.3E+03	--	--	5.3E+05	--	--	--	--	--	--	--	--	5.3E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	2.8E+02	--	--	2.8E+04	--	--	--	--	--	--	--	--	2.8E+04
2,4-Dinitrotoluene [C]	0	--	--	3.4E+01	--	--	3.4E+03	--	--	--	--	--	--	--	--	3.4E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.1E-08	--	--	5.1E-06	--	--	--	--	--	--	--	--	5.1E-06
1,2-Diphenylhydrazine[C]	0	--	--	2.0E+00	--	--	2.0E+02	--	--	--	--	--	--	--	--	2.0E+02
Alpha-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	3.4E+00	8.7E-01	8.9E+03	--	--	--	--	--	--	3.4E+00	8.7E-01	8.9E+03

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Beta-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	3.4E+00	8.7E-01	8.9E+03	--	--	--	--	--	--	3.4E+00	8.7E-01	8.9E+03
Alpha + Beta Endosulfan	0	3.4E-02	8.7E-03	--	3.4E+00	8.7E-01	--	--	--	--	--	--	--	3.4E+00	8.7E-01	--
Endosulfan Sulfate	0	--	--	8.9E+01	--	--	8.9E+03	--	--	--	--	--	--	--	--	8.9E+03
Endrin	0	3.7E-02	2.3E-03	6.0E-02	3.7E+00	2.3E-01	6.0E+00	--	--	--	--	--	--	3.7E+00	2.3E-01	6.0E+00
Endrin Aldehyde	0	--	--	3.0E-01	--	--	3.0E+01	--	--	--	--	--	--	--	--	3.0E+01
Ethylbenzene	0	--	--	2.1E+03	--	--	2.1E+05	--	--	--	--	--	--	--	--	2.1E+05
Fluoranthene	0	--	--	1.4E+02	--	--	1.4E+04	--	--	--	--	--	--	--	--	1.4E+04
Fluorene	0	--	--	5.3E+03	--	--	5.3E+05	--	--	--	--	--	--	--	--	5.3E+05
Guthion	0	--	1.0E-02	--	--	1.0E+00	--	--	--	--	--	--	--	--	1.0E+00	--
Heptachlor [C]	0	5.3E-02	3.6E-03	7.9E-04	5.3E+00	3.6E-01	7.9E-02	--	--	--	--	--	--	5.3E+00	3.6E-01	7.9E-02
Heptachlor Epoxide[C]	0	5.3E-02	3.6E-03	3.9E-04	5.3E+00	3.6E-01	3.9E-02	--	--	--	--	--	--	5.3E+00	3.6E-01	3.9E-02
Hexachlorobenzene[C]	0	--	--	2.9E-03	--	--	2.9E-01	--	--	--	--	--	--	--	--	2.9E-01
Hexachlorobutadiene[C]	0	--	--	1.8E+02	--	--	1.8E+04	--	--	--	--	--	--	--	--	1.8E+04
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	4.9E-02	--	--	4.9E+00	--	--	--	--	--	--	--	--	4.9E+00
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	1.7E-01	--	--	1.7E+01	--	--	--	--	--	--	--	--	1.7E+01
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	1.6E-01	--	1.8E+00	1.6E+01	--	1.8E+02	--	--	--	--	--	--	1.6E+01	--	1.8E+02
Hexachlorocyclopentadiene	0	--	--	1.1E+03	--	--	1.1E+05	--	--	--	--	--	--	--	--	1.1E+05
Hexachloroethane[C]	0	--	--	3.3E+01	--	--	3.3E+03	--	--	--	--	--	--	--	--	3.3E+03
Hydrogen Sulfide	0	--	2.0E+00	--	--	2.0E+02	--	--	--	--	--	--	--	--	2.0E+02	--
Indeno (1,2,3-cd) pyrene C	0	--	--	1.8E-01	--	--	1.8E+01	--	--	--	--	--	--	--	--	1.8E+01
Isophorone[C]	0	--	--	9.6E+03	--	--	9.6E+05	--	--	--	--	--	--	--	--	9.6E+05
Kepone	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00	--
Lead	0	2.4E+02	9.3E+00	--	2.4E+04	9.3E+02	--	--	--	--	--	--	--	2.4E+04	9.3E+02	--
Malathion	0	--	1.0E-01	--	--	1.0E+01	--	--	--	--	--	--	--	--	1.0E+01	--
Mercury	0	1.8E+00	9.4E-01	--	1.8E+02	9.4E+01	--	--	--	--	--	--	--	1.8E+02	9.4E+01	--
Methyl Bromide	0	--	--	1.5E+03	--	--	1.5E+05	--	--	--	--	--	--	--	--	1.5E+05
Methylene Chloride [C]	0	--	--	5.9E+03	--	--	5.9E+05	--	--	--	--	--	--	--	--	5.9E+05
Methoxychlor	0	--	3.0E-02	--	--	3.0E+00	--	--	--	--	--	--	--	--	3.0E+00	--
Mirex	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00	--
Nickel	0	7.4E+01	8.2E+00	4.6E+03	7.4E+03	8.2E+02	4.6E+05	--	--	--	--	--	--	7.4E+03	8.2E+02	4.6E+05
Nitrobenzene	0	--	--	6.9E+02	--	--	6.9E+04	--	--	--	--	--	--	--	--	6.9E+04
N-Nitrosodimethylamine[C]	0	--	--	3.0E+01	--	--	3.0E+03	--	--	--	--	--	--	--	--	3.0E+03
N-Nitrosodiphenylamine[C]	0	--	--	6.0E+01	--	--	6.0E+03	--	--	--	--	--	--	--	--	6.0E+03
N-Nitrosodi-n-propylamine[C]	0	--	--	5.1E+00	--	--	5.1E+02	--	--	--	--	--	--	--	--	5.1E+02
Nonylphenol	0	7.0E+00	1.7E+00	--	7.0E+02	1.7E+02	--	--	--	--	--	--	--	7.0E+02	1.7E+02	--
Parathion	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB Total[C]	0	--	3.0E-02	6.4E-04	--	3.0E+00	6.4E-02	--	--	--	--	--	--	--	3.0E+00	6.4E-02
Pentachlorophenol [C]	0	1.3E+01	7.9E+00	3.0E+01	1.3E+03	7.9E+02	3.0E+03	--	--	--	--	--	--	1.3E+03	7.9E+02	3.0E+03

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Phenol	0	--	--	8.6E+05	--	--	8.6E+07	--	--	--	--	--	--	--	--	8.6E+07
Phosphorus (Elemental)	0	--	1.0E-01	--	--	1.0E+01	--	--	--	--	--	--	--	--	1.0E+01	--
Pyrene	0	--	--	4.0E+03	--	--	4.0E+05	--	--	--	--	--	--	--	--	4.0E+05
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	4.0E+02	--	--	--	--	--	--	--	--	4.0E+02
Selenium	0	2.9E+02	7.1E+01	4.2E+03	2.9E+04	7.1E+03	4.2E+05	--	--	--	--	--	--	2.9E+04	7.1E+03	4.2E+05
Silver	0	1.9E+00	--	--	1.9E+02	--	--	--	--	--	--	--	--	1.9E+02	--	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	4.0E+01	--	--	4.0E+03	--	--	--	--	--	--	--	--	4.0E+03
Tetrachloroethylene[C]	0	--	--	3.3E+01	--	--	3.3E+03	--	--	--	--	--	--	--	--	3.3E+03
Thallium	0	--	--	4.7E-01	--	--	4.7E+01	--	--	--	--	--	--	--	--	4.7E+01
Toluene	0	--	--	6.0E+03	--	--	6.0E+05	--	--	--	--	--	--	--	--	6.0E+05
Toxaphene [C]	0	2.1E-01	2.0E-04	2.8E-03	2.1E+01	2.0E-02	2.8E-01	--	--	--	--	--	--	2.1E+01	2.0E-02	2.8E-01
Tributyltin	0	4.2E-01	7.4E-03	--	4.2E+01	7.4E-01	--	--	--	--	--	--	--	4.2E+01	7.4E-01	--
1,2,4-Trichlorobenzene	0	--	--	7.0E+01	--	--	7.0E+03	--	--	--	--	--	--	--	--	7.0E+03
1,1,2-Trichloroethane[C]		--	--	1.6E+02	--	--	1.6E+04	--	--	--	--	--	--	--	--	1.6E+04
Trichloroethylene [C]	0	--	--	3.0E+02	--	--	3.0E+04	--	--	--	--	--	--	--	--	3.0E+04
2,4,6-Trichlorophenol [C]	0	--	--	2.4E+01	--	--	2.4E+03	--	--	--	--	--	--	--	--	2.4E+03
Vinyl Chloride[C]	0	--	--	2.4E+01	--	--	2.4E+03	--	--	--	--	--	--	--	--	2.4E+03
Zinc	0	9.0E+01	8.1E+01	2.6E+04	9.0E+03	8.1E+03	2.6E+06	--	--	--	--	--	--	9.0E+03	8.1E+03	2.6E+06

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. For transition zone waters, spreadsheet prints the lesser of the freshwater and saltwater water quality criteria.
6. Regular WLA = (WQC x WLA multiplier) - (WLA multiplier - 1)(background conc.)
7. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
8. Antideg. WLA = (Antideg. Baseline)(WLA multiplier) - (WLA multiplier - 1)(background conc.)

Metal	Site Specific Target Value (SSTV)
Antimony	6.4E+04
Arsenic III	2.2E+03
Cadmium	5.3E+02
Chromium III	#VALUE!
Chromium VI	3.0E+03
Copper	3.6E+02
Lead	5.6E+02
Mercury	5.6E+01
Nickel	4.9E+02
Selenium	4.3E+03
Silver	7.6E+01
Zinc	3.6E+03

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Reasonable Potential Analysis
Outfall 002

All data is in ug/L unless otherwise noted.
NDR: No data reported.
All data as reported with permit application unless otherwise noted.
Pollutants reported as at a QL equal to or less than the DEQ specified QL are considered absent for the purpose of this evaluation.

PARAMETER	Effluent Data	ACUTE WLA	CHRONIC WLA	HUMAN HEALTH STANDARD	COMMENTS
Acenapthene	NDR	-	-	99,000	Not evaluated.
Acrolein	<10.0	-	-	930	Reported value below WLA. No limit required.
Acrylonitrile	<10.0	-	-	250	Reported value below WLA. No limit required.
Aldrin	NDR	-	-	0.05	Not evaluated.
Ammonia-N (mg/l) - Annual	DMR: 1.2, 8.8, 89.1, 61.5, 8.97, 4.43, 3.7, 5.5, 14.9, 19.2, 7.4, 9.0, 1.6, 0.9, 2.6, 1.75, 8.95, 16.1, 0.78, 0.74, 11.1, 0.97, 0.82, 1.9, 4.4, 14.1, 21.0, 34, 7.5, 11.6 29.2, 23.8, 16.8, 22.3, 34.0	132	19.9	-	Statistical evaluation of DMR data indicates the need for a limitation of 32.6 mg/L (40.2 mg/L max).
Ammonia-N (mg/l) - Winter	Not Applicable	-	-	-	Does not apply because no tiered limits in permit.
Anthracene	NDR	-	-	4,000,000	Not evaluated.
Antimony	NDR	-	-	64,000	Not evaluated.
Arsenic	NDR	6,900	3,600	-	Not evaluated.
Benzene	NDR	-	-	51,000	Not evaluated.
Benzidine	<50.0	-	-	0.2	Reported QL greater than HH. Retesting recommended.
Benzo (a) anthracene	NDR	-	-	18	Not evaluated.
Benzo (b) fluoranthene	NDR	-	-	18	Not evaluated.
Benzo (k) fluoranthene	NDR	-	-	18	Not evaluated.
Benzo (a) pyrene	NDR	-	-	18	Not evaluated.
Bis2-Chloroethyl Ether	<10.0	-	-	530	Reported value below WLA. No limit required.
Bis2-Chloroisopropyl Ether	<10.0	-	-	6,500,000	Reported value below WLA. No limit required.
Bis2-Ethylhexyl Phthalate	NDR	-	-	2,200	Not evaluated.
Bromoform	NDR	-	-	140,000	Not evaluated.
Butyl benzyl phthalate	NDR	-	-	190,000	Not evaluated.
Cadmium	NDR	4,000	880	-	Not evaluated.
Carbon Tetrachloride	NDR	-	-	1,600	Not evaluated.
Chlorodane	NDR	9	0.4	0.81	Not evaluated.
TRC	Not Required	-	-	-	Discharge to salt water.
Chlorine Prod. Oxidant	NDR	1,300	750	-	Not evaluated.
Chlorobenzene	<10.0	-	-	160,000	Reported value below WLA. No limit required.
Chlorodibromomethane	NDR	-	-	13,000	Not evaluated.
Chloroform	NDR	-	-	1,100,000	Not evaluated.
2-Chloronaphthalene	<10.0	-	-	160,000	Reported value below WLA. No limit required.
2-Chlorophenol	NDR	-	-	15,000	Not evaluated.
Chlorpyrifos	NDR	1.1	0.56	-	Not evaluated.
Chromium III	NDR	-	-	-	Not evaluated.
Chromium VI	NDR	110,000	5,000	-	Not evaluated.
Chrysene	NDR	-	-	1.8	Not evaluated.
Copper	NDR	930	600	-	Not evaluated.
Cyanide, Free	NDR	100	100	1,600,000	Not evaluated.
DDD	NDR	-	-	0.31	Not evaluated.
DDE	NDR	-	-	0.22	Not evaluated.
DDT	NDR	13	0.1	0.22	Not evaluated.

Demeton	NDR	-	10	-	Not evaluated.
Diazinon	NDR	82	82	-	Not evaluated.
Dibenz(a,h)anthracene	NDR	-	-	18	Not evaluated.
1,2-Dichlorobenzene	NDR	-	-	130,000	Not evaluated.
1,3-Dichlorobenzene	NDR	-	-	96,000	Not evaluated.
1,4-Dichlorobenzene	NDR	-	-	19,000	Not evaluated.
3,3-Dichlorobenzidine	<10.0			28	Reported value below WLA. No limit required.
Dichlorobromomethane	NDR	-	-	17,000	Not evaluated.
1,2-Dichloroethane	NDR	-	-	37,000	Not evaluated.
1,1-Dichloroethylene	NDR	-	-	710,000	Not evaluated.
1,2-trans-dichloroethylene	<10.0	-	-	1,000,000	Reported value below WLA. No limit required.
2,4-Dichlorophenol	NDR	-	-	29,000	Not evaluated.
1,2-Dichloropropane	<10.0	-	-	15,000	Reported value below WLA. No limit required.
1,3-Dichloropropene	<10.0	-	-	21,000	Reported value below WLA. No limit required.
Dieldrin	NDR	71	0.19	0.054	Not evaluated.
Diethyl Phthalate	NDR	-	-	4,400,000	Not evaluated.
2,4-Dimethylphenol	NDR	-	-	85,000	Not evaluated.
Dimethyl Phthalate	<10.0	-	-	110,000,000	Reported value below WLA. No limit required.
Di-n-Butyl Phthalate	<10.0	-	-	450,000	Reported value below WLA. No limit required.
2,4 Dinitrophenol	<50.0	-	-	530,000	Reported value below WLA. No limit required.
2-Methyl-4,6-Dinitrophenol	<50.0	-	-	28,000	Reported value below WLA. No limit required.
2,4-Dinitrotoluene	NDR	-	-	3,400	Not evaluated.
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	NDR	-	-	0.0000051	Not evaluated.
1,2-Diphenylhydrazine	<10.0	-	-	200	Reported value below WLA. No limit required.
Alpha-Endosulfan	<0.104	3.4	0.87	8,900	Reported value is below detection level. Believed absent.
Beta-Endosulfan	<0.042	3.4	0.87	8,900	Reported value is below detection level. Believed absent.
Alpha + Beta Endosulfan	NDR	3.4	0.87	-	Not evaluated.
Endosulfan Sulfate	<0.010	-	-	8,900	Reported value below WLA. No limit required.
Endrin	NDR	3.7	0.23	6	Not evaluated.
Endrin Aldehyde	<0.208	-	-	30	Reported value below WLA. No limit required.
Ethylbenzene	NDR	-	-	210,000	Not evaluated.
Fluoranthene	NDR	-	-	14,000	Not evaluated.
Fluorene	NDR	-	-	530,000	Not evaluated.
Guthion	NDR	-	1	-	Not evaluated.
Heptachlor	NDR	5.3	0.36	0.079	Not evaluated.
Heptachlor Epoxide	<0.208	5.3	0.36	0.039	Reported value is below detection level. Believed absent.
Hexachlorobenzene	<10.0	-	-	0.29	Reported QL greater than HH. Retesting recommended.
Hexachlorobutadiene	<10.0	-	-	18,000	Reported value below standard. No limit required.
Hexachlorocyclohexane Alpha-BHC	<0.021	-	-	4.9	Reported value below standard. No limit required.
Hexachlorocyclohexane Beta-BHC	<0.052	-	-	17	Reported value below standard. No limit required.
Hexachlorocyclohexane Gamma-BHC (Lindane)	NDR	16	-	180	Not evaluated.
Hexachlorocyclopentadiene	<10.0	-	-	110,000	Reported value below WLA. No limit required.
Hexachloroethane	<10.0	-	-	3,300	Reported value below WLA. No limit required.

Hydrogen Sulfide	NDR	-	200	-	Not evaluated.
Indeno (1,2,3-cd) pyrene	NDR	-	-	18	Not evaluated.
Isophorone	NDR	-	-	960,000	Not evaluated.
Kepone	NDR	-	0	-	Not evaluated.
Lead	NDR	24,000	930	-	Not evaluated.
Malathion	NDR	-	10	-	Not evaluated.
Mercury	NDR	180	94	-	Not evaluated.
Methyl Bromide	<10.0	-	-	150,000	Reported value below WLA. No limit required.
Methylene Chloride	NDR	-	-	590,000	Not evaluated.
Methoxychlor	NDR	-	-	-	Not evaluated.
Mirex	NDR	-	-	-	Not evaluated.
Nickel	NDR	7,400	820	460,000	Not evaluated.
Nitrobenzene	NDR	-	-	69,000	Not evaluated.
N-Nitrosodimethylamine	<10.0	-	-	3,000	Reported value below WLA. No limit required.
N-Nitrosodiphenylamine	<10.0	-	-	6,000	Reported value below WLA. No limit required.
N-Nitrosodi-n-propylamine	<10.0	-	-	510	Reported value below WLA. No limit required.
Nonylphenol	NDR	700	170	-	Not evaluated.
Parathion	NDR	-	-	-	Not evaluated.
PCB Total	***	-	3	0.064	Permittee provided PCB data for individual congers as follows: Aroclor1016: <1 Aroclor1248: <1 Aroclor1221: <1 Aroclor1254: <1 Aroclor1232: <1 Aroclor1260: <1 Aroclor1242: <1 Retesting of total PCB recommended..
Pentachlorophenol	NDR	1,300	790	3,000	Not evaluated.
Phenol	NDR	-	-	86,000,000	Not evaluated.
Phosphorus (Elemental)	NDR	-	10	-	Not evaluated.
Pyrene	NDR	-	-	4000,000	Not evaluated.
Radionuclides	NDR	-	-	-	Not evaluated.
Beta and Photon Activity (mrem/yr)	NDR	-	-	400	Not evaluated.
Selenium	NDR	29,000	7,100	420,000	Not evaluated.
Silver	NDR	190	-	-	Not evaluated.
1,1,2,2-Tetrachloroethane	<10.0	-	-	4,000	Reported value below WLA. No limit required.
Tetrachloroethylene	NDR	-	-	3,300	Not evaluated.
Thallium	<0.05	-	-	47	Reported value below WLA. No limit required.
Toluene	NDR	-	-	600,000	Not evaluated.
Toxaphene	NDR	21	0.02	0.28	Not evaluated.
Tributyltin	NDR	42	0.74	-	Not evaluated.
1,2,4-Trichlorobenzene	NDR	-	-	7,000	Not evaluated.
1,1,2-Trichloroethane	<10.0	-	-	16,000	Reported value below WLA. No limit required.
Trichloroethylene	NDR	-	-	30,000	Not evaluated.
2,4,6-Trichlorophenol	NDR	-	-	2,400	Not evaluated.
Vinyl Chloride	NDR	-	-	2,400	Not evaluated.
Zinc	NDR	9,000	8,100	2,600,000	Not evaluated.

Chemical = Ammonia
Chronic averaging period = 30
WLAa = 132
WLAc = 19.9
WLAc = 19.9
Q.L. = 0.1
# samples/mo. = 2
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 250
Variance = 22500
C.V. = 0.6
97th percentile daily values = 608.354
97th percentile 4 day average = 415.947
97th percentile 30 day average= 301.513
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 40.1516348589846
Average Weekly limit = 40.1516348589846
Average Monthly LImit = 32.6506665763086

The data are:

250

GM00-2011 instructs staff that if an industrial facility has an ammonia limitation that data collected to demonstrate compliance with that limitation cannot be used to determine if a reasonable potential to cause or contribute to a violation of the water quality standard exists. In order to evaluate the reasonable potential for ammonia from industrial facility with an ammonia permit limitation, a high, fictitious data point (rather than actual data) should be entered into the statistical analysis software. The resulting limitation is then compared to the existing limitation to determine if it is sufficient to protect water quality.

Previously the ammonia limitation at Outfall 002 was a 38.0 mg/L (average) and 45.0 mg/L (maximum). As demonstrated by the statistical analysis on the left, these limitations are not protective of water quality; therefore, more stringent limitations for ammonia are needed. Ammonia limitations at Outfall 002 will be revised to 32.6 mg/L (average) and 40.2 mg/L (maximum). Because monthly reporting data submitted by the permittee indicates that they are able to consistently achieve these concentrations, no compliance schedule for ammonia will be implemented.

Attachment 8 – Effluent Limitation Development – Outfall 995

Outfall 995 DMR Data

Units (unless otherwise noted)	Loading		Concentration		
	kg/d		mg/L		
	Avg	Max	Avg	Min	Max
FLOW (MGD)	3.597	8.424			
	5.985	8.424			
	7.477	8.424			
	6.01	8.424			
	3.34	4.21			
	3.605	4.223			
	2.633	4.213			
	3.707	4.212			
	0.351	0.351			
	2.227	2.457			
	3.131	4.212			
	2.852	4.212			
	3.159	4.212			
	3.129	4.212			
	2.887	4.212			
	1.993	4.212			
	3.422	3.422			
	3.194	4.212			
	3.514	4.212			
	3.568	4.212			
	2.837	4.212			
	3.093	4.212			
	2.319	4.212			
	3.408	4.124			
	1.097	1.536			
	2.463	4.212			
	2.555	4.212			
	3.188	4.212			
	2.708	4.037			
	3.026	4.212			
	1.604	4.212			
	2.282	2.282			
	5.621	8.424			
	6.992	8.424			
	6.652	8.424			
	6.431	8.424			
	6.189	8.424			
	6.3	8.4			
	4.8	8.4			
	4.6	6.8			
PH (S.U.)				7.86	8.24
				7.79	8.07
				7.53	8.23
				7.76	8.33
				7.29	8.02
				7.46	8.18
				7.46	8.4
				8.18	8.5
				8.37	7.37
				7.8	8.2
				7.82	8.29
				7.72	8.11

Average Flow:	3.69865	MGD
Maximum Flow:	8.424	MGD

				7.5	8.3
				7.6	8.1
				7.5	8
				7.96	8.29
				8.3	8.3
				7.52	8.35
				7.35	8.17
				7.2	8.4
				7.54	7.9
				7.46	8.1
				7.73	8.22
				8.18	8.22
				7.77	8.28
				7.68	8.29
				7.55	8.06
				7.32	8.07
				6.91	7.88
				7.4	8.16
				7.75	7.99
				7.87	7.87
				7.49	8.05
				7.87	8.28
				7.94	8.03
				7.64	8.02
				7.58	8.03
				7.75	8.57
				8	8.8
				8	8.1
COPPER, TOTAL			33		33
(ug/L)			47		47
			32		32
			34		34
			31		31
			33		33
			41		41
			31		31
			70		70
			49		49
			41		41
			30		30
			16		16
			<QL		<QL
			48		48
			47		47
			55		55
			5.3		5.3
			5.5		5.5
			6.4		6.4
			5		5
			5.3		5.3
			3.2		3.2
			4.9		4.9
			5		5
			4		4
			4		4
			9.3		9.3
			5.6		5.6

10th Percentile Max pH:	7.981	S.U.
90th Percentile Max pH:	8.4	S.U.

			5.2		5.2
			<QL		<QL
TEMPERATURE, WATER (°C)			30.2		31.3
			33.9		35.9
			34.5		38.6
			26.7		36.5
			26.6		32
			25.5		32
			19.5		21.9
			8.18		8.5
			16.2		16.2
			31.7		38
			34.7		38.9
			33.3		39.4
			34		39.8
			31		32.6
			28.2		31.8
			20		20
			17.9		17.9
			36.5		44.9
			33.6		38.5
			32.3		37
			32.9		37.3
			28.2		31.9
			16.72		22.1
			19.7		20.5
			30.2		37.6
			31.7		37.4
			34		42
			37.5		42.4
			30.5		34.3
			27.6		36
			22.7		23.5
			17.6		17.6
			33.6		39.2
			32.7		40.2
			31.6		45
			36.4		43.2
			34.6		40.9
			28.5		37
			18		20
			17		18.1
SILVER, TOTAL RECOVERABLE			1.8		1.8
(ug/L)			2.76		2.76
			9.24		9.24
			8.2		8.2
			2.62		2.62
			1.92		1.92
			9.9		9.9
			2.62		2.62
			2.82		2.82
			0.5		0.5
			3.2		3.2
			<QL		<QL
			<QL		<QL
			2.27		2.27

90th PercentileTemp: 32.4475 °C

			<QL		<QL
			1.79		1.79
			18.7		18.7
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
COPPER, TOTAL RECOVERABLE			<QL		<QL
(ug/L)			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
ZINC, DISSOLVED			50		50
(ug/L)			58		58
			57		57
			49		49
			48		48
			54		54
			55		55
			40		40
			54		54
			50		50
			50		50
			65		65
			68		68
			<QL		<QL
			72		72
			81		81
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			15.7		15.7
			<QL		<QL
			<QL		<QL
			<QL		<QL

			<QL		<QL
			<QL		<QL
			14.5		14.5
			12.4		12.4
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			8		8
			<QL		<QL
			<QL		<QL
			<QL		<QL
			<QL		<QL
			24		24
			<QL		<QL

VA0003867 – Omega Protein Inc.

MSTRANTI DATA SOURCE REPORT FOR OUTFALL 995

Stream Information:	**Basis**
Mean Hardness	Not Applicable for Salt Water
90th% Temperature (Annual)	Ambient Data for Station 7-COC001.61
90th% Temperature (Winter)	No Tiered Limitations, Not Applicable
90th% Maximum pH	Ambient Data for Station 7-COC001.61
10th% Maximum pH	Ambient Data for Station 7-COC001.61
Tier Designation	Flow Frequency Memorandum
Mean Salinity	Ambient Data for Station 7-COC001.61
Mixing Information:	
Design Flow	Maximum 30 Day Value as Reported in Form 2C Application
Acute WLA Multiplier	Agency default per GM00-2011
Chronic WLA Multiplier	
Human Health WLA Multiplier	
Effluent Information:	
Mean Hardness	Not Applicable for Salt Water
90th% Temperature (Annual)	DMR Effluent Data
90th% Temperature (Winter)	No Tiered Limitations, Not Applicable
90th% Maximum pH	Ambient Data for Station 7-COC001.61
10th% Maximum pH	
Discharge Flow	Maximum 30 Day Value as Reported in Form 2C Application

SALTWATER AND TRANSITION ZONES
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Omega Protein Outfall 995 Permit No.: VA0003867 Version: OWP Guidance Memo 00-2011 (8/24/00)
Receiving Stream: Cockrells Creek

Stream Information		
Mean Hardness (as CaCO3) =	NA	mg/l
90th % Temperature (Annual) =	28.6	(° C)
90th % Temperature (Winter) =	NA	(° C)
90th % Maximum pH =	8.4	
10th % Maximum pH =	7.7	
Tier Designation (1 or 2) =	1	
Early Life Stages Present Y/N =	Y	
Tidal Zone =	1	(1 = saltwater, 2 = transition zone)
Mean Salinity =	16.2	(g/kg)

Mixing Information	
Design Flow (MGD)	3.188
Acute WLA multiplier	2
Chronic WLA multiplier	50
Human health WLA multiplier	50

Effluent Information		
Mean Hardness (as CaCO3) =	NA	mg/L
90 % Temperature (Annual) =	32.4475	(° C)
90 % Temperature (Winter) =	NA	(° C)
90 % Maximum pH =	8.4	SU
10 % Maximum pH =	7.981	SU
Discharge Flow =	3.188	MGD

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Acenapthene	0	--	--	9.9E+02	--	--	5.0E+04	--	--	--	--	--	--	--	--	5.0E+04
Acrolein		--	--	9.3E+00	--	--	4.7E+02	--	--	--	--	--	--	--	--	4.7E+02
Acrylonitrile[C]		--	--	2.5E+00	--	--	1.3E+02	--	--	--	--	--	--	--	--	1.3E+02
Aldrin [C]	0	1.3E+00	--	5.0E-04	2.6E+00	--	2.5E-02	--	--	--	--	--	--	2.6E+00	--	2.5E-02
Ammonia-N (mg/l) - Annual	0	1.13E+00	1.98E-01	--	2.25E+00	9.91E+00	--	--	--	--	--	--	--	2.25E+00	9.91E+00	--
Ammonia-N (mg/l) - Winter	0	#VALUE!	#VALUE!	--	#VALUE!	#VALUE!	--	--	--	--	--	--	--	#VALUE!	#VALUE!	--
Anthracene	0	--	--	4.0E+04	--	--	2.0E+06	--	--	--	--	--	--	--	--	2.0E+06
Antimony	0	--	--	6.4E+02	--	--	3.2E+04	--	--	--	--	--	--	--	--	3.2E+04
Arsenic	0	6.9E+01	3.6E+01	--	1.4E+02	1.8E+03	--	--	--	--	--	--	--	1.4E+02	1.8E+03	--
Benzene [C]	0	--	--	5.1E+02	--	--	2.6E+04	--	--	--	--	--	--	--	--	2.6E+04
Benzidine[C]		--	--	2.0E-03	--	--	1.0E-01	--	--	--	--	--	--	--	--	1.0E-01
Benzo (a) anthracene [C]	0	--	--	1.8E-01	--	--	9.0E+00	--	--	--	--	--	--	--	--	9.0E+00
Benzo (b) fluoranthene [C]	0	--	--	1.8E-01	--	--	9.0E+00	--	--	--	--	--	--	--	--	9.0E+00
Benzo (k) fluoranthene [C]	0	--	--	1.8E-01	--	--	9.0E+00	--	--	--	--	--	--	--	--	9.0E+00
Benzo (a) pyrene [C]	0	--	--	1.8E-01	--	--	9.0E+00	--	--	--	--	--	--	--	--	9.0E+00
Bis2-Chloroethyl Ether[C]	0	--	--	5.3E+00	--	--	2.7E+02	--	--	--	--	--	--	--	--	2.7E+02
Bis2-Chloroisopropyl Ether	0	--	--	6.5E+04	--	--	3.3E+06	--	--	--	--	--	--	--	--	3.3E+06
Bis2-Ethylhexyl Phthalate[C]	0	--	--	2.2E+01	--	--	1.1E+03	--	--	--	--	--	--	--	--	1.1E+03
Bromoform [C]	0	--	--	1.4E+03	--	--	7.0E+04	--	--	--	--	--	--	--	--	7.0E+04
Butylbenzylphthalate	0	--	--	1.9E+03	--	--	9.5E+04	--	--	--	--	--	--	--	--	9.5E+04
Cadmium	0	4.0E+01	8.8E+00	--	8.0E+01	4.4E+02	--	--	--	--	--	--	--	8.0E+01	4.4E+02	--
Carbon Tetrachloride [C]	0	--	--	1.6E+01	--	--	8.0E+02	--	--	--	--	--	--	--	--	8.0E+02
Chlordane [C]	0	9.0E-02	4.0E-03	8.1E-03	1.8E-01	2.0E-01	4.1E-01	--	--	--	--	--	--	1.8E-01	2.0E-01	4.1E-01

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
TRC	0			--			--	--	--	--	--	--	--	--	--	--
Chlorine Prod. Oxidant	0	1.3E+01	7.5E+00	--	2.6E+01	3.8E+02	--	--	--	--	--	--	--	2.6E+01	3.8E+02	--
Chlorobenzene		--	--	1.6E+03	--	--	8.0E+04	--	--	--	--	--	--	--	--	8.0E+04
Chlorodibromomethane[C]	0	--	--	1.3E+02	--	--	6.5E+03	--	--	--	--	--	--	--	--	6.5E+03
Chloroform	0	--	--	1.1E+04	--	--	5.5E+05	--	--	--	--	--	--	--	--	5.5E+05
2-Chloronaphthalene	0	--	--	1.6E+03	--	--	8.0E+04	--	--	--	--	--	--	--	--	8.0E+04
2-Chlorophenol	0	--	--	1.5E+02	--	--	7.5E+03	--	--	--	--	--	--	--	--	7.5E+03
Chlorpyrifos	0	1.1E-02	5.6E-03	--	2.2E-02	2.8E-01	--	--	--	--	--	--	--	2.2E-02	2.8E-01	--
Chromium III	0			--			--	--	--	--	--	--	--	--	--	--
Chromium VI	0	1.1E+03	5.0E+01	--	2.2E+03	2.5E+03	--	--	--	--	--	--	--	2.2E+03	2.5E+03	--
Chrysene[C]	0	--	--	1.8E-02	--	--	9.0E-01	--	--	--	--	--	--	--	--	9.0E-01
Copper	0	9.3E+00	6.0E+00	--	1.9E+01	3.0E+02	--	--	--	--	--	--	--	1.9E+01	3.0E+02	--
Cyanide, Free	0	1.0E+00	1.0E+00	1.6E+04	2.0E+00	5.0E+01	8.0E+05	--	--	--	--	--	--	2.0E+00	5.0E+01	8.0E+05
DDD[C]	0	--	--	3.1E-03	--	--	1.6E-01	--	--	--	--	--	--	--	--	1.6E-01
DDE[C]	0	--	--	2.2E-03	--	--	1.1E-01	--	--	--	--	--	--	--	--	1.1E-01
DDT[C]	0	1.3E-01	1.0E-03	2.2E-03	2.6E-01	5.0E-02	1.1E-01	--	--	--	--	--	--	2.6E-01	5.0E-02	1.1E-01
Demeton	0	--	1.0E-01	--	--	5.0E+00	--	--	--	--	--	--	--	--	5.0E+00	--
Diazinon	0	8.2E-01	8.2E-01	--	1.6E+00	4.1E+01	--	--	--	--	--	--	--	1.6E+00	4.1E+01	--
Dibenz(a,h)anthracene[C]	0	--	--	1.8E-01	--	--	9.0E+00	--	--	--	--	--	--	--	--	9.0E+00
1,2-Dichlorobenzene	0	--	--	1.3E+03	--	--	6.5E+04	--	--	--	--	--	--	--	--	6.5E+04
1,3-Dichlorobenzene	0	--	--	9.6E+02	--	--	4.8E+04	--	--	--	--	--	--	--	--	4.8E+04
1,4-Dichlorobenzene	0	--	--	1.9E+02	--	--	9.5E+03	--	--	--	--	--	--	--	--	9.5E+03
3,3-Dichlorobenzidine[C]	0	--	--	2.8E-01	--	--	1.4E+01	--	--	--	--	--	--			
Dichlorobromomethane[C]	0	--	--	1.7E+02	--	--	8.5E+03	--	--	--	--	--	--	--	--	8.5E+03
1,2-Dichloroethane[C]	0	--	--	3.7E+02	--	--	1.9E+04	--	--	--	--	--	--	--	--	1.9E+04
1,1-Dichloroethylene	0	--	--	7.1E+03	--	--	3.6E+05	--	--	--	--	--	--	--	--	3.6E+05
1,2-trans-dichloroethylene	0	--	--	1.0E+04	--	--	5.0E+05	--	--	--	--	--	--	--	--	5.0E+05
2,4-Dichlorophenol	0	--	--	2.9E+02	--	--	1.5E+04	--	--	--	--	--	--	--	--	1.5E+04
1,2-Dichloropropane[C]	0	--	--	1.5E+02	--	--	7.5E+03	--	--	--	--	--	--	--	--	7.5E+03
1,3-Dichloropropene[C]	0	--	--	2.1E+02	--	--	1.1E+04	--	--	--	--	--	--	--	--	1.1E+04
Dieldrin[C]	0	7.1E-01	1.9E-03	5.4E-04	1.4E+00	9.5E-02	2.7E-02	--	--	--	--	--	--	1.4E+00	9.5E-02	2.7E-02
Diethyl Phthalate	0	--	--	4.4E+04	--	--	2.2E+06	--	--	--	--	--	--	--	--	2.2E+06
2,4-Dimethylphenol	0	--	--	8.5E+02	--	--	4.3E+04	--	--	--	--	--	--	--	--	4.3E+04
Dimethyl Phthalate	0	--	--	1.1E+06	--	--	5.5E+07	--	--	--	--	--	--	--	--	5.5E+07
Di-n-Butyl Phthalate	0	--	--	4.5E+03	--	--	2.3E+05	--	--	--	--	--	--	--	--	2.3E+05
2,4 Dinitrophenol	0	--	--	5.3E+03	--	--	2.7E+05	--	--	--	--	--	--	--	--	2.7E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	2.8E+02	--	--	1.4E+04	--	--	--	--	--	--	--	--	1.4E+04
2,4-Dinitrotoluene[C]	0	--	--	3.4E+01	--	--	1.7E+03	--	--	--	--	--	--	--	--	1.7E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	5.1E-08	--	--	2.6E-06	--	--	--	--	--	--	--	--	2.6E-06
1,2-Diphenylhydrazine[C]	0	--	--	2.0E+00	--	--	1.0E+02	--	--	--	--	--	--	--	--	1.0E+02
Alpha-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	6.8E-02	4.4E-01	4.5E+03	--	--	--	--	--	--	6.8E-02	4.4E-01	4.5E+03

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Beta-Endosulfan	0	3.4E-02	8.7E-03	8.9E+01	6.8E-02	4.4E-01	4.5E+03	--	--	--	--	--	--	6.8E-02	4.4E-01	4.5E+03
Alpha + Beta Endosulfan	0	3.4E-02	8.7E-03	--	6.8E-02	4.4E-01	--	--	--	--	--	--	--	6.8E-02	4.4E-01	--
Endosulfan Sulfate	0	--	--	8.9E+01	--	--	4.5E+03	--	--	--	--	--	--	--	--	4.5E+03
Endrin	0	3.7E-02	2.3E-03	6.0E-02	7.4E-02	1.2E-01	3.0E+00	--	--	--	--	--	--	7.4E-02	1.2E-01	3.0E+00
Endrin Aldehyde	0	--	--	3.0E-01	--	--	1.5E+01	--	--	--	--	--	--	--	--	1.5E+01
Ethylbenzene	0	--	--	2.1E+03	--	--	1.1E+05	--	--	--	--	--	--	--	--	1.1E+05
Fluoranthene	0	--	--	1.4E+02	--	--	7.0E+03	--	--	--	--	--	--	--	--	7.0E+03
Fluorene	0	--	--	5.3E+03	--	--	2.7E+05	--	--	--	--	--	--	--	--	2.7E+05
Guthion	0	--	1.0E-02	--	--	5.0E-01	--	--	--	--	--	--	--	--	5.0E-01	--
Heptachlor [C]	0	5.3E-02	3.6E-03	7.9E-04	1.1E-01	1.8E-01	4.0E-02	--	--	--	--	--	--	1.1E-01	1.8E-01	4.0E-02
Heptachlor Epoxide[C]	0	5.3E-02	3.6E-03	3.9E-04	1.1E-01	1.8E-01	2.0E-02	--	--	--	--	--	--	1.1E-01	1.8E-01	2.0E-02
Hexachlorobenzene[C]	0	--	--	2.9E-03	--	--	1.5E-01	--	--	--	--	--	--	--	--	1.5E-01
Hexachlorobutadiene[C]	0	--	--	1.8E+02	--	--	9.0E+03	--	--	--	--	--	--	--	--	9.0E+03
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	4.9E-02	--	--	2.5E+00	--	--	--	--	--	--	--	--	2.5E+00
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	1.7E-01	--	--	8.5E+00	--	--	--	--	--	--	--	--	8.5E+00
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	1.6E-01	--	1.8E+00	3.2E-01	--	9.0E+01	--	--	--	--	--	--	3.2E-01	--	9.0E+01
Hexachlorocyclopentadiene	0	--	--	1.1E+03	--	--	5.5E+04	--	--	--	--	--	--	--	--	5.5E+04
Hexachloroethane[C]	0	--	--	3.3E+01	--	--	1.7E+03	--	--	--	--	--	--	--	--	1.7E+03
Hydrogen Sulfide	0	--	2.0E+00	--	--	1.0E+02	--	--	--	--	--	--	--	--	1.0E+02	--
Indeno (1,2,3-cd) pyrene C	0	--	--	1.8E-01	--	--	9.0E+00	--	--	--	--	--	--	--	--	9.0E+00
Isophorone[C]	0	--	--	9.6E+03	--	--	4.8E+05	--	--	--	--	--	--	--	--	4.8E+05
Kepone	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00	--
Lead	0	2.4E+02	9.3E+00	--	4.8E+02	4.7E+02	--	--	--	--	--	--	--	4.8E+02	4.7E+02	--
Malathion	0	--	1.0E-01	--	--	5.0E+00	--	--	--	--	--	--	--	--	5.0E+00	--
Mercury	0	1.8E+00	9.4E-01	--	3.6E+00	4.7E+01	--	--	--	--	--	--	--	3.6E+00	4.7E+01	--
Methyl Bromide	0	--	--	1.5E+03	--	--	7.5E+04	--	--	--	--	--	--	--	--	7.5E+04
Methylene Chloride [C]	0	--	--	5.9E+03	--	--	3.0E+05	--	--	--	--	--	--	--	--	3.0E+05
Methoxychlor	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	1.5E+00	--
Mirex	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	0.0E+00	--
Nickel	0	7.4E+01	8.2E+00	4.6E+03	1.5E+02	4.1E+02	2.3E+05	--	--	--	--	--	--	1.5E+02	4.1E+02	2.3E+05
Nitrobenzene	0	--	--	6.9E+02	--	--	3.5E+04	--	--	--	--	--	--	--	--	3.5E+04
N-Nitrosodimethylamine[C]	0	--	--	3.0E+01	--	--	1.5E+03	--	--	--	--	--	--	--	--	1.5E+03
N-Nitrosodiphenylamine[C]	0	--	--	6.0E+01	--	--	3.0E+03	--	--	--	--	--	--	--	--	3.0E+03
N-Nitrosodi-n-propylamine[C]	0	--	--	5.1E+00	--	--	2.6E+02	--	--	--	--	--	--	--	--	2.6E+02
Nonylphenol	0	7.0E+00	1.7E+00	--	1.4E+01	8.5E+01	--	--	--	--	--	--	--	1.4E+01	8.5E+01	--
Parathion	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB Total[C]	0	--	3.0E-02	6.4E-04	--	1.5E+00	3.2E-02	--	--	--	--	--	--	--	1.5E+00	3.2E-02
Pentachlorophenol [C]	0	1.3E+01	7.9E+00	3.0E+01	2.6E+01	4.0E+02	1.5E+03	--	--	--	--	--	--	2.6E+01	4.0E+02	1.5E+03

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			**Most Limiting Allocations**		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	**Acute**	**Chronic**	**HH**
Phenol	0	--	--	8.6E+05	--	--	4.3E+07	--	--	--	--	--	--	--	--	**4.3E+07**
Phosphorus (Elemental)	0	--	1.0E-01	--	--	5.0E+00	--	--	--	--	--	--	--	--	**5.0E+00**	--
Pyrene	0	--	--	4.0E+03	--	--	2.0E+05	--	--	--	--	--	--	--	--	**2.0E+05**
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	2.0E+02	--	--	--	--	--	--	--	--	**2.0E+02**
Selenium	0	2.9E+02	7.1E+01	4.2E+03	5.8E+02	3.6E+03	2.1E+05	--	--	--	--	--	--	**5.8E+02**	**3.6E+03**	**2.1E+05**
Silver	0	1.9E+00	--	--	3.8E+00	--	--	--	--	--	--	--	--	**3.8E+00**	--	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	4.0E+01	--	--	2.0E+03	--	--	--	--	--	--	--	--	**2.0E+03**
Tetrachloroethylene[C]	0	--	--	3.3E+01	--	--	1.7E+03	--	--	--	--	--	--	--	--	**1.7E+03**
Thallium	0	--	--	4.7E-01	--	--	2.4E+01	--	--	--	--	--	--	--	--	**2.4E+01**
Toluene	0	--	--	6.0E+03	--	--	3.0E+05	--	--	--	--	--	--	--	--	**3.0E+05**
Toxaphene [C]	0	2.1E-01	2.0E-04	2.8E-03	4.2E-01	1.0E-02	1.4E-01	--	--	--	--	--	--	**4.2E-01**	**1.0E-02**	**1.4E-01**
Tributyltin	0	4.2E-01	7.4E-03	--	8.4E-01	3.7E-01	--	--	--	--	--	--	--	**8.4E-01**	**3.7E-01**	--
1,2,4-Trichlorobenzene	0	--	--	7.0E+01	--	--	3.5E+03	--	--	--	--	--	--	--	--	**3.5E+03**
1,1,2-Trichloroethane[C]		--	--	1.6E+02	--	--	8.0E+03	--	--	--	--	--	--	--	--	**8.0E+03**
Trichloroethylene [C]	0	--	--	3.0E+02	--	--	1.5E+04	--	--	--	--	--	--	--	--	**1.5E+04**
2,4,6-Trichlorophenol [C]	0	--	--	2.4E+01	--	--	1.2E+03	--	--	--	--	--	--	--	--	**1.2E+03**
Vinyl Chloride[C]	0	--	--	2.4E+01	--	--	1.2E+03	--	--	--	--	--	--	--	--	**1.2E+03**
Zinc	0	9.0E+01	8.1E+01	2.6E+04	1.8E+02	4.1E+03	1.3E+06	--	--	--	--	--	--	**1.8E+02**	**4.1E+03**	**1.3E+06**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. For transition zone waters, spreadsheet prints the lesser of the freshwater and saltwater water quality criteria.
6. Regular WLA = (WQC x WLA multiplier) - (WLA multiplier - 1)(background conc.)
7. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
8. Antideg. WLA = (Antideg. Baseline)(WLA multiplier) - (WLA multiplier - 1)(background conc.)

Metal	Site Specific Target Value (SSTV)
Antimony	3.2E+04
Arsenic III	5.5E+01
Cadmium	3.2E+01
Chromium III	#VALUE!
Chromium VI	8.8E+02
Copper	7.4E+00
Lead	1.9E+02
Mercury	1.4E+00
Nickel	5.9E+01
Selenium	2.3E+02
Silver	1.5E+00
Zinc	7.2E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

All data is in ug/L unless otherwise noted.
NDR: No data reported.
All data as reported with permit application unless otherwise noted.
Pollutants reported as at a QL equal to or less than the DEQ specified QL are considered absent for the purpose of this evaluation.

PARAMETER	Effluent Data	ACUTE WLA	CHRONIC WLA	HUMAN HEALTH STANDARD	COMMENTS
Acenapthene	NDR	-	-	50,000	Not evaluated.
Acrolein	<10.0	-	-	470	Reported value below WLA. No limit required.
Acrylonitrile	<10.0	-	-	130	Reported value below WLA. No limit required.
Aldrin	NDR	2.6	-	0.025	Not evaluated.
Ammonia-N (mg/l) - Annual	<0.2	2.25	9.91	-	Believed absent. No evaluation required.
Ammonia-N (mg/l) - Winter	Not Applicable	-	-	-	Does not apply because no tiered limits in permit.
Anthracene	NDR	-	-	2,000,000	Not evaluated.
Antimony	NDR	-	-	32,000	Not evaluated.
Arsenic	NDR	140	1800	-	Not evaluated.
Benzene	NDR	-	-	26,000	Not evaluated.
Benzidine	<50.0	-	-	0.1	Reported QL greater than HH. Retesting recommended.
Benzo (a) anthracene	NDR	-	-	9	Not evaluated.
Benzo (b) fluoranthene	NDR	-	-	9	Not evaluated.
Benzo (k) fluoranthene	NDR	-	-	9	Not evaluated.
Benzo (a) pyrene	NDR	-	-	9	Not evaluated.
Bis2-Chloroethyl Ether	<10.0	-	-	270	Reported value below WLA. No limit required.
Bis2-Chloroisopropyl Ether	<10.0	-	-	3,300,000	Reported value below WLA. No limit required.
Bis2-Ethylhexyl Phthalate	<10.0	-	-	1,100	Reported value below WLA. No limit required.
Bromoform	NDR	-	-	70,000	Not evaluated.
Butyl benzyl phthalate	NDR	-	-	95,000	Not evaluated.
Cadmium	NDR	80	440	-	Not evaluated.
Carbon Tetrachloride	NDR	-	-	800	Not evaluated.
Chlorodane	NDR	0.18	0.2	0.41	Not evaluated.
TRC	Not Required	-	-	-	Discharge to salt water.
Chlorine Prod. Oxidant	NDR	26	380	-	Not evaluated.
Chlorobenzene	<10.0	-	-	80,000	Reported value below WLA. No limit required.
Chlorodibromomethane	NDR	-	-	6,500	Not evaluated.
Chloroform	NDR	-	-	550,000	Not evaluated.
2-Chloronaphthalene	<10.0	-	-	80,000	Reported value below WLA. No limit required.
2-Chlorophenol	NDR	-	-	7,500	Not evaluated.
Chlorpyrifos	NDR	0.022	0.28	-	Not evaluated.
Chromium III	NDR	-	-	-	Not evaluated.
Chromium VI	NDR	2,200	2,500	-	Not evaluated.
Chrysene	<10.0	-	-	0.9	Reported QL greater than HH. Retesting recommended.
Copper, Total Recoverable	DMR: <QL	19	300	-	Copper limitation became effective on 12/1/09. All data submitted after 12/1/09 was reported below QL. No analysis required. Previous limitation will be carried forward due to anti-backsliding policy.
Cyanide, Free	NDR	2	50	800,000	Not evaluated.
DDD	NDR	-	-	0.16	Not evaluated.
DDE	NDR	-	-	0.11	Not evaluated.
DDT	NDR	0.26	0.05	0.11	Not evaluated.
Demeton	NDR	-	5	-	Not evaluated.
Diazinon	NDR	1.6	41	-	Not evaluated.
Dibenz(a,h)anthracene	NDR	-	-	9	Not evaluated.

1,2-Dichlorobenzene	NDR	-	-	65,000	Not evaluated.
1,3-Dichlorobenzene	NDR	-	-	48,000	Not evaluated.
1,4-Dichlorobenzene	NDR	-	-	9,500	Not evaluated.
3,3-Dichlorobenzidine	<10.0			14	Reported value below WLA. No limit required.
Dichlorobromomethane	NDR	-	-	8,500	Not evaluated.
1,2-Dichloroethane	NDR	-	-	19,000	Not evaluated.
1,1-Dichloroethylene	NDR	-	-	360,000	Not evaluated.
1,2-trans-dichloroethylene	<10.0	-	-	500,000	Reported value below WLA. No limit required.
2,4-Dichlorophenol	NDR	-	-	15,000	Not evaluated.
1,2-Dichloropropane	<10.0	-	-	7,500	Reported value below WLA. No limit required.
1,3-Dichloropropene	<10.0	-	-	11,000	Reported value below WLA. No limit required.
Dieldrin	NDR	1.4	0.095	0.027	Not evaluated.
Diethyl Phthalate	<10.0	-	-	2,200,000	Reported value below WLA. No limit required.
2,4-Dimethylphenol	NDR	-	-	43,000	Not evaluated.
Dimethyl Phthalate	NDR	-	-	55,000,000	Not evaluated.
Di-n-Butyl Phthalate	<10.0	-	-	230,000	Reported value below WLA. No limit required.
2,4 Dinitrophenol	<50.0	-	-	270,000	Reported value below WLA. No limit required.
2-Methyl-4,6-Dinitrophenol	<50.0	-	-	14,000	Reported value below WLA. No limit required.
2,4-Dinitrotoluene	NDR	-	-	1,700	Not evaluated.
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	NDR	-	-	0.0000026	Not evaluated.
1,2-Diphenylhydrazine	<10.0	-	-	100	Reported value below WLA. No limit required.
Alpha-Endosulfan	<0.10	0.068	0.44	4,500	Reported value is below detection level. Believed absent.
Beta-Endosulfan	<0.04	0.068	0.44	4,500	Reported value is below detection level. Believed absent.
Alpha + Beta Endosulfan	NDR	0.068	0.44	-	Not evaluated.
Endosulfan Sulfate	<0.01	-	-	4,500	Reported value below WLA. No limit required.
Endrin	NDR	0.074	0.12	3	Not evaluated.
Endrin Aldehyde	<0.20	-	-	15	Reported value below WLA. No limit required.
Ethylbenzene	NDR	-	-	110,000	Not evaluated.
Fluoranthene	NDR	-	-	7,000	Not evaluated.
Fluorene	NDR	-	-	270,000	Not evaluated.
Guthion	NDR	-	0.5	-	Not evaluated.
Heptachlor	NDR	0.11	0.18	0. 04	Not evaluated.
Heptachlor Epoxide	<0.02	0.11	0.18	0.02	Reported QL less than WLA. No limit required.
Hexachlorobenzene	<10.0	-	-	0.15	Reported QL greater than HH. Retesting recommended.
Hexachlorobutadiene	<10.0	-	-	9,000	Reported value below WLA. No limit required.
Hexachlorocyclohexane Alpha-BHC	<0.02	-	-	2. 5	Reported value below WLA. No limit required.
Hexachlorocyclohexane Beta-BHC	<0.05	-	-	8.5	Reported value below WLA. No limit required.
Hexachlorocyclohexane Gamma-BHC (Lindane)	NDR	0.32	-	90	Not evaluated.
Hexachlorocyclopentadiene	<10.0	-	-	55,000	Reported value below WLA. No limit required.
Hexachloroethane	<10.0	-	-	1,700	Reported value below WLA. No limit required.
Hydrogen Sulfide	NDR	-	100	-	Not evaluated.
Indeno (1,2,3-cd) pyrene	NDR	-	-	9	Not evaluated.
Isophorone	NDR	-	-	480,000	Not evaluated.
Kepone	NDR	-	0	-	Not evaluated.
Lead	NDR	480	470	-	Not evaluated.
Malathion	NDR	-	5	-	Not evaluated.
Mercury	NDR	3.6	47	-	Not evaluated.

Methyl Bromide	<10.0	-	-	75,000	Reported value below WLA. No limit required.
Methylene Chloride	NDR	-	-	300,000	Not evaluated.
Methoxychlor	NDR	-	1.5	-	Not evaluated.
Mirex	NDR	-	0	-	Not evaluated.
Nickel	NDR	150	410	230,000	Not evaluated.
Nitrobenzene	NDR	-	-	350,000	Not evaluated.
N-Nitrosodimethylamine	<10.0	-	-	1,500	Reported value below WLA. No limit required.
N-Nitrosodiphenylamine	<10.0	-	-	3,000	Reported value below WLA. No limit required.
N-Nitrosodi-n-propylamine	<10.0	-	-	260	Reported value below WLA. No limit required.
Nonylphenol	NDR	14	85	-	Not evaluated.
Parathion	NDR	-	-	-	Not evaluated.
PCB Total	***	-	1.5	0.032	Permittee provided PCB data for individual congers as follows: Aroclor1016: <1 Aroclor1248: <1 Aroclor1221: <1 Aroclor1254: <1 Aroclor1232: <1 Aroclor1260: <1 Aroclor1242: <1 Retesting of total PCB recommended.
Pentachlorophenol	NDR	26	400	1,500	Not evaluated.
Phenol	NDR	-	-	43,000,000	Not evaluated.
Phosphorus (Elemental)	NDR	-	5	-	Not evaluated.
Pyrene	NDR	-	-	2,000,000	Not evaluated.
Radionuclides	NDR	-	-	-	Not evaluated.
Beta and Photon Activity (mrem/yr)	NDR	-	-	200	Not evaluated.
Selenium	NDR	580	3,600	210,000	Not evaluated.
Silver	DMR: <QL	3.8	-	-	Silver limitation became effective on 12/1/09. All data submitted after 12/1/09 was reported below QL. No analysis required. Previous limitation will be carried forward due to anti-backsliding policy.
1,1,2,2-Tetrachloroethane	<10.0	-	-	2,000	Reported value below WLA. No limit required.
Tetrachloroethylene	NDR	-	-	1,700	Not evaluated.
Thallium	NDR	-	-	24	Not evaluated.
Toluene	NDR	-	-	300,000	Not evaluated.
Toxaphene	NDR	0.42	0.01	0.14	Not evaluated.
Tributyltin	NDR	0.84	0.37	-	Not evaluated.
1,2,4-Trichlorobenzene	NDR	-	-	3,500	Not evaluated.
1,1,2-Trichloroethane	<10.0	-	-	8,000	Reported value below WLA. No limit required.
Trichloroethylene	NDR	-	-	15,000	Not evaluated.
2,4,6-Trichlorophenol	NDR	-	-	1,200	Not evaluated.
Vinyl Chloride	NDR	-	-	1,200	Not evaluated.
Zinc	DMR: 50, 58, 57, 49, 48, 54, 55, 40, 54, 50, 50, 65, 68, 72, 81, 15.7, 14.5, 12.4, 8, 24	180	4,100	1,300,000	Previous permit required monitoring only. Statistical evaluation of data indicates no limitation is necessary. Monitoring removed from permit.

Chemical = Zinc
Chronic averaging period = 4
WLAa = 180
WLAc = 4100
Q.L. = 72
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 20
Expected Value = 41.2447
Variance = 612.405
C.V. = 0.6
97th percentile daily values = 100.365
97th percentile 4 day average = 68.6225
97th percentile 30 day average= 49.7433
< Q.L. = 18
Model used = BPJ Assumptions, Type 1 data

No Limit is required for this material

The data are:

50
58
57
49
48
54
55
40
54
50
50
65
68
72
81
15.7
14.5
12.4
8
24

SALTWATER AND TRANSITION ZONES
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

2005 Permit

Facility Name: Omega Protein 004/005 995 | Permit No.: VA0003867 | Version: OWP Guidance Memo 00-2011 (8/24/00)
Receiving Stream: Cockrell's Creek

Stream Information

Mean Hardness (as CaCO3) =	NA	mg/l
90th % Temperature (Annual) =	28.41	(° C)
90th % Temperature (Winter) =		(° C)
90th % Maximum pH =	8.37	
10th % Maximum pH =		
Tier Designation (1 or 2) =	1	
Early Life Stages Present Y/N =	Y	
Tidal Zone =	1	(1 = saltwater, 2 = transition zone)
Mean Salinity =	17	(g/kg)

Mixing Information

Design Flow (MGD)	14.2
Acute WLA multiplier	2
Chronic WLA multiplier	50
Human health WLA multiplier	50

Agency defaults used

Effluent Information

Mean Hardness (as CaCO3) =	NA	mg/L
90 % Temperature (Annual) =	38	(° C)
90 % Temperature (Winter) =	22	(° C)
90 % Maximum pH =	8.94	SU
10 % Maximum pH =		SU
Discharge Flow =	14.2	MGD

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Acenapthene	0	--	--	2.7E+03	--	--	1.4E+05	--	--	--	--	--	--	--	--	1.4E+05
Acrolein		--	--	7.8E+02	--	--	3.9E+04	--	--	--	--	--	--	--	--	3.9E+04
Acrylonitrile[c]		--	--	6.6E+00	--	--	3.3E+02	--	--	--	--	--	--	--	--	3.3E+02
Aldrin [c]	0	1.3E+00	--	1.4E-03	2.6E+00	--	7.0E-02	--	--	--	--	--	--	2.6E+00	--	7.0E-02
Ammonia-N (mg/l) - Annual	0	7.1E-01	2.1E-01	--	1.4E+00	1.0E+01	--	--	--	--	--	--	--	1.4E+00	1.0E+01	--
Ammonia-N (mg/l) - Winter	0	2.9E+00	1.5E+00	--	5.9E+00	7.5E+01	--	--	--	--	--	--	--	5.9E+00	7.5E+01	--
Anthracene	0	--	--	1.1E+05	--	--	5.5E+06	--	--	--	--	--	--	--	--	5.5E+06
Antimony	0	--	--	4.3E+03	--	--	2.2E+05	--	--	--	--	--	--	--	--	2.2E+05
Arsenic	0	6.9E+01	3.6E+01	--	1.4E+02	1.8E+03	--	--	--	--	--	--	--	1.4E+02	1.8E+03	--
Benzene [c]	0	--	--	7.1E+02	--	--	3.6E+04	--	--	--	--	--	--	--	--	3.6E+04
Benzidine[c]		--	--	5.4E-03	--	--	2.7E-01	--	--	--	--	--	--	--	--	2.7E-01
Benzo (a) anthracene [c]	0	--	--	4.9E-01	--	--	2.5E+01	--	--	--	--	--	--	--	--	2.5E+01
Benzo (b) fluoranthene [c]	0	--	--	4.9E-01	--	--	2.5E+01	--	--	--	--	--	--	--	--	2.5E+01
Benzo (k) fluoranthene [c]	0	--	--	4.9E-01	--	--	2.5E+01	--	--	--	--	--	--	--	--	2.5E+01
Benzo (a) pyrene [c]	0	--	--	4.9E-01	--	--	2.5E+01	--	--	--	--	--	--	--	--	2.5E+01
Bis2-Chloroethyl Ether		--	--	1.4E+01	--	--	7.0E+02	--	--	--	--	--	--	--	--	7.0E+02
Bis2-Chloroisopropyl Ether		--	--	1.7E+05	--	--	8.5E+06	--	--	--	--	--	--	--	--	8.5E+06
Bromoform [c]	0	--	--	3.6E+03	--	--	1.8E+05	--	--	--	--	--	--	--	--	1.8E+05
Butylbenzylphthalate	0	--	--	5.2E+03	--	--	2.6E+05	--	--	--	--	--	--	--	--	2.6E+05
Cadmium	0	4.0E+01	8.8E+00	--	8.0E+01	4.4E+02	--	--	--	--	--	--	--	8.0E+01	4.4E+02	--
Carbon Tetrachloride [c]	0	--	--	4.4E+01	--	--	2.2E+03	--	--	--	--	--	--	--	--	2.2E+03
Chlordane [c]	0	9.0E-02	4.0E-03	2.2E-02	1.8E-01	2.0E-01	1.1E+00	--	--	--	--	--	--	1.8E-01	2.0E-01	1.1E+00
TRC	0			--			--	--	--	--	--	--	--	--	--	--
Chlorine Prod. Oxidant	0	1.3E+01	7.5E+00	--	2.6E+01	3.8E+02	--	--	--	--	--	--	--	2.6E+01	3.8E+02	--

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria Acute	Chronic	HH	Wasteload Allocations Acute	Chronic	HH	Antidegradation Baselines and Loadings Acute	Chronic	HH	Antidegradation Allocations Acute	Chronic	HH	Most Limiting Allocations Acute	Chronic	HH
Chlorobenzene		--	--	2.1E+04	--	--	1.1E+06	--	--	--	--	--	--	--	--	1.1E+06
Chlorodibromomethane[C]	0	--	--	3.4E+02	--	--	1.7E+04	--	--	--	--	--	--	--	--	1.7E+04
Chloroform [C]	0	--	--	2.9E+04	--	--	1.5E+06	--	--	--	--	--	--	--	--	1.5E+06
2-Chloronaphthalene	0	--	--	4.3E+03	--	--	2.2E+05	--	--	--	--	--	--	--	--	2.2E+05
2-Chlorophenol	0	--	--	4.0E+02	--	--	2.0E+04	--	--	--	--	--	--	--	--	2.0E+04
Chlorpyrifos	0	1.1E-02	5.6E-03	--	2.2E-02	2.8E-01	--	--	--	--	--	--	--	2.2E-02	2.8E-01	--
Chromium III	0			--			--	--	--	--	--	--	--	--	--	--
Chromium VI	0	1.1E+03	5.0E+01	--	2.2E+03	2.5E+03	--	--	--	--	--	--	--	2.2E+03	2.5E+03	--
Chrysene [C]	0	--	--	4.9E-01	--	--	2.5E+01	--	--	--	--	--	--	--	--	2.5E+01
Copper	0	9.3E+00	6.0E+00	--	1.9E+01	3.0E+02	--	--	--	--	--	--	--	1.9E+01	3.0E+02	--
Cyanide	0	1.0E+00	1.0E+00	2.2E+05	2.0E+00	5.0E+01	1.1E+07	--	--	--	--	--	--	2.0E+00	5.0E+01	1.1E+07
DDD [C]	0	--	--	8.4E-03	--	--	4.2E-01	--	--	--	--	--	--	--	--	4.2E-01
DDE [C]	0	--	--	5.9E-03	--	--	3.0E-01	--	--	--	--	--	--	--	--	3.0E-01
DDT [C]	0	1.3E-01	1.0E-03	5.9E-03	2.6E-01	5.0E-02	3.0E-01	--	--	--	--	--	--	2.6E-01	5.0E-02	3.0E-01
Demeton	0	--	1.0E-01	--	--	5.0E+00	--	--	--	--	--	--	--	--	5.0E+00	--
Dibenz(a,h)anthracene [C]	0	--	--	4.9E-01	--	--	2.5E+01	--	--	--	--	--	--	--	--	2.5E+01
Dibutyl phthalate	0	--	--	1.2E+04	--	--	6.0E+05	--	--	--	--	--	--	--	--	6.0E+05
Dichloromethane (Methylene Chloride)[C]	0	--	--	1.6E+04	--	--	8.0E+05	--	--	--	--	--	--	--	--	8.0E+05
1,2-Dichlorobenzene	0	--	--	1.7E+04	--	--	8.5E+05	--	--	--	--	--	--	--	--	8.5E+05
1,3-Dichlorobenzene	0	--	--	2.6E+03	--	--	1.3E+05	--	--	--	--	--	--	--	--	1.3E+05
1,4-Dichlorobenzene	0	--	--	2.6E+03	--	--	1.3E+05	--	--	--	--	--	--	--	--	1.3E+05
3,3-Dichlorobenzidine[C]	0	--	--	7.7E-01	--	--	3.9E+01	--	--	--	--	--	--			
Dichlorobromomethane [C]	0	--	--	4.6E+02	--	--	2.3E+04	--	--	--	--	--	--	--	--	2.3E+04
1,2-Dichloroethane [C]	0	--	--	9.9E+02	--	--	5.0E+04	--	--	--	--	--	--	--	--	5.0E+04
1,1-Dichloroethylene	0	--	--	1.7E+04	--	--	8.5E+05	--	--	--	--	--	--	--	--	8.5E+05
1,2-trans-dichloroethylene	0	--	--	1.4E+05	--	--	7.0E+06	--	--	--	--	--	--	--	--	7.0E+06
2,4-Dichlorophenol	0	--	--	7.9E+02	--	--	4.0E+04	--	--	--	--	--	--	--	--	4.0E+04
1,2-Dichloropropane[C]	0	--	--	3.9E+02	--	--	2.0E+04	--	--	--	--	--	--	--	--	2.0E+04
1,3-Dichloropropene	0	--	--	1.7E+03	--	--	8.5E+04	--	--	--	--	--	--	--	--	8.5E+04
Dieldrin [C]	0	7.1E-01	1.9E-03	1.4E-03	1.4E+00	9.5E-02	7.0E-02	--	--	--	--	--	--	1.4E+00	9.5E-02	7.0E-02
Diethyl Phthalate	0	--	--	1.2E+05	--	--	6.0E+06	--	--	--	--	--	--	--	--	6.0E+06
Di-2-Ethylhexyl Phthalate [C]	0	--	--	5.9E+01	--	--	3.0E+03	--	--	--	--	--	--	--	--	3.0E+03
2,4-Dimethylphenol	0	--	--	2.3E+03	--	--	1.2E+05	--	--	--	--	--	--	--	--	1.2E+05
Dimethyl Phthalate	0	--	--	2.9E+06	--	--	1.5E+08	--	--	--	--	--	--	--	--	1.5E+08
Di-n-Butyl Phthalate	0	--	--	1.2E+04	--	--	6.0E+05	--	--	--	--	--	--	--	--	6.0E+05
2,4 Dinitrophenol	0	--	--	1.4E+04	--	--	7.0E+05	--	--	--	--	--	--	--	--	7.0E+05
2-Methyl-4,6-Dinitrophenol	0	--	--	7.65E+02	--	--	3.8E+04	--	--	--	--	--	--	--	--	3.8E+04
2,4-Dinitrotoluene [C]	0	--	--	9.1E+01	--	--	4.6E+03	--	--	--	--	--	--	--	--	4.6E+03
Dioxin (2,3,7,8-tetrachlorodibenzo-p-dioxin) (ppq)	0	--	--	1.2E-06	--	--	6.0E-05	--	--	--	--	--	--	--	--	6.0E-05
1,2-Diphenylhydrazine[C]	0	--	--	5.1E+00	--	--	2.7E+02	--	--	--	--	--	--	--	--	2.7E+02
Alpha-Endosulfan	0	3.4E-02	8.7E-03	2.4E+02	6.8E-02	4.4E-01	1.2E+04	--	--	--	--	--	--	6.8E-02	4.4E-01	1.2E+04

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baselines			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
Beta-Endosulfan	0	3.4E-02	8.7E-03	2.4E+02	6.8E-02	4.4E-01	1.2E+04	--	--	--	--	--	--	**6.8E-02**	**4.4E-01**	**1.2E+04**
Endosulfan Sulfate	0	--	--	2.4E+02	--	--	1.2E+04	--	--	--	--	--	--	--	--	**1.2E+04**
Endrin	0	3.7E-02	2.3E-03	8.1E-01	7.4E-02	1.2E-01	4.1E+01	--	--	--	--	--	--	**7.4E-02**	**1.2E-01**	**4.1E+01**
Endrin Aldehyde	0	--	--	8.1E-01	--	--	4.1E+01	--	--	--	--	--	--	--	--	**4.1E+01**
Ethylbenzene	0	--	--	2.9E+04	--	--	1.5E+06	--	--	--	--	--	--	--	--	**1.5E+06**
Fluoranthene	0	--	--	3.7E+02	--	--	1.9E+04	--	--	--	--	--	--	--	--	**1.9E+04**
Fluorene	0	--	--	1.4E+04	--	--	7.0E+05	--	--	--	--	--	--	--	--	**7.0E+05**
Guthion	0	--	1.0E-02	--	--	5.0E-01	--	--	--	--	--	--	--	--	**5.0E-01**	--
Heptachlor [C]	0	5.3E-02	3.6E-03	2.1E-03	1.1E-01	1.8E-01	1.1E-01	--	--	--	--	--	--	**1.1E-01**	**1.8E-01**	**1.1E-01**
Heptachlor Epoxide [C]	0	5.3E-02	3.6E-03	1.1E-03	1.1E-01	1.8E-01	5.5E-02	--	--	--	--	--	--	**1.1E-01**	**1.8E-01**	**5.5E-02**
Hexachlorobenzene [C]	0	--	--	7.7E-03	--	--	3.9E-01	--	--	--	--	--	--	--	--	**3.9E-01**
Hexachlorobutadiene [C]	0	--	--	5.0E+02	--	--	2.5E+04	--	--	--	--	--	--	--	--	**2.5E+04**
Hexachlorocyclohexane Alpha-BHC [C]	0	--	--	1.3E-01	--	--	6.5E+00	--	--	--	--	--	--	--	--	**6.5E+00**
Hexachlorocyclohexane Beta-BHC [C]	0	--	--	4.6E-01	--	--	2.3E+01	--	--	--	--	--	--	--	--	**2.3E+01**
Hexachlorocyclohexane Gamma-BHC [C] (Lindane)	0	1.6E-01	--	6.3E-01	3.2E-01	--	3.2E+01	--	--	--	--	--	--	**3.2E-01**	--	**3.2E+01**
Hexachlorocyclopentadiene	0	--	--	1.7E+04	--	--	8.5E+05	--	--	--	--	--	--	--	--	**8.5E+05**
Hexachloroethane [C]	0	--	--	8.9E+01	--	--	4.5E+03	--	--	--	--	--	--	--	--	**4.5E+03**
Hydrogen Sulfide	0	--	2.0E+00		--	1.0E+02	--	--	--	--	--	--	--	--	**1.0E+02**	--
Indeno (1,2,3-cd) pyrene C	0	--	--	4.9E-01	--	--	2.5E+01	--	--	--	--	--	--	--	--	**2.5E+01**
Isophorone [C]	0	--	--	2.6E+04	--	--	1.3E+06	--	--	--	--	--	--	--	--	**1.3E+06**
Kepone	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	**0.0E+00**	--
Lead	0	2.4E+02	9.3E+00	--	4.8E+02	4.7E+02	--	--	--	--	--	--	--	**4.8E+02**	**4.7E+02**	--
Malathion	0	--	1.0E-01	--	--	5.0E+00	--	--	--	--	--	--	--	--	**5.0E+00**	--
Mercury	0	1.8E+00	9.4E-01	5.1E-02	3.6E+00	4.7E+01	2.6E+00	--	--	--	--	--	--	**3.6E+00**	**4.7E+01**	**2.6E+00**
Methyl Bromide	0	--	--	4.0E+03	--	--	2.0E+05	--	--	--	--	--	--	--	--	**2.0E+05**
Methoxychlor	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	**1.5E+00**	--
Mirex	0	--	0.0E+00	--	--	0.0E+00	--	--	--	--	--	--	--	--	**0.0E+00**	--
Monochlorobenzene	0	--	--	2.1E+04	--	--	1.1E+06	--	--	--	--	--	--	--	--	**1.1E+06**
Nickel	0	7.4E+01	8.2E+00	4.6E+03	1.5E+02	4.1E+02	2.3E+05	--	--	--	--	--	--	**1.5E+02**	**4.1E+02**	**2.3E+05**
Nitrobenzene	0	--	--	1.9E+03	--	--	9.5E+04	--	--	--	--	--	--	--	--	**9.5E+04**
N-Nitrosodimethylamine [C]	0	--	--	8.1E+01	--	--	4.1E+03	--	--	--	--	--	--	--	--	**4.1E+03**
N-Nitrosodiphenylamine [C]	0	--	--	1.6E+02	--	--	8.0E+03	--	--	--	--	--	--	--	--	**8.0E+03**
N-Nitrosodi-n-propylamine [C]	0	--	--	1.4E-01	--	--	7.0E+02	--	--	--	--	--	--	--	--	**7.0E+02**
Parathion	0			--			--	--	--	--	--	--	--	--	--	--
PCB-1016	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	**1.5E+00**	--
PCB-1221	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	**1.5E+00**	--
PCB-1232	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	**1.5E+00**	--
PCB-1242	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	**1.5E+00**	--
PCB-1248	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	**1.5E+00**	--
PCB-1254	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	**1.5E+00**	--

Parameter	Background	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Effluent Limits		
(ug/l unless noted)	Conc.	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH	Acute	Chronic	HH
PCB-1260	0	--	3.0E-02	--	--	1.5E+00	--	--	--	--	--	--	--	--	1.5E+00	--
PCB Total[C]	0	--	--	1.7E-03	--	--	8.5E-02	--	--	--	--	--	--	--	--	8.5E-02
Pentachlorophenol [C]	0	1.3E+01	7.9E+00	8.2E+01	2.6E+01	4.0E+02	4.1E+03	--	--	--	--	--	--	2.6E+01	4.0E+02	4.1E+03
Phenol	0	--	--	4.6E+06	--	--	2.3E+08	--	--	--	--	--	--	--	--	2.3E+08
Phosphorus (Elemental)	0	--	0.1	--	--	5.0E+00	--	--	--	--	--	--	--	--	5.0E+00	--
Pyrene	0	--	--	1.1E+04	--	--	5.5E+05	--	--	--	--	--	--	--	--	5.5E+05
Radionuclides (pCi/l except Beta/Photon)	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity	0	--	--	1.5E+01	--	--	7.5E+02	--	--	--	--	--	--	--	--	7.5E+02
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	2.0E+02	--	--	--	--	--	--	--	--	2.0E+02
Strontium-90	0	--	--	8.0E+00	--	--	4.0E+02	--	--	--	--	--	--	--	--	4.0E+02
Tritium	0	--	--	2.0E+04	--	--	1.0E+06	--	--	--	--	--	--	--	--	1.0E+06
Selenium	0	3.0E+02	7.1E+01	1.1E+04	6.0E+02	3.6E+03	5.5E+05	--	--	--	--	--	--	6.0E+02	3.6E+03	5.5E+05
Silver	0	2.0E+00	--	--	4.0E+00	--	--	--	--	--	--	--	--	4.0E+00	--	--
1,1,2,2-Tetrachloroethane[C]	0	--	--	1.7E+02	--	--	5.5E+03	--	--	--	--	--	--	--	--	5.5E+03
Tetrachloroethylene[C]	0	--	--	8.9E+01	--	--	4.5E+03	--	--	--	--	--	--	--	--	4.5E+03
Thallium	0	--	--	6.3E+00	--	--	3.2E+02	--	--	--	--	--	--	--	--	3.2E+02
Toluene	0	--	--	2.0E+05	--	--	1.0E+07	--	--	--	--	--	--	--	--	1.0E+07
Toxaphene [C]	0	2.1E-01	2.0E-04	7.5E-03	4.2E-01	1.0E-02	3.8E-01	--	--	--	--	--	--	4.2E-01	1.0E-02	3.8E-01
Tributyltin	0	3.8E-01	1.0E-03	--	7.6E-01	5.0E-02	--	--	--	--	--	--	--	7.6E-01	5.0E-02	--
1,2,4-Trichlorobenzene	0	--	--	9.4E+02	--	--	4.7E+04	--	--	--	--	--	--	--	--	4.7E+04
1,1,2-Trichloroethane[C]	0	--	--	4.2E+02	--	--	2.1E+04	--	--	--	--	--	--	--	--	2.1E+04
Trichloroethylene [C]	0	--	--	8.1E+02	--	--	4.1E+04	--	--	--	--	--	--	--	--	4.1E+04
2,4,6-Trichlorophenol [C]	0	--	--	6.5E+01	--	--	3.3E+03	--	--	--	--	--	--	--	--	3.3E+03
Vinyl Chloride[C]	0	--	--	6.1E+01	--	--	3.1E+03	--	--	--	--	--	--	--	--	3.1E+03
Zinc	0	9.0E+01	8.1E+01	6.9E+04	1.8E+02	4.1E+03	3.5E+06	--	--	--	--	--	--	1.8E+02	4.1E+03	3.5E+06

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. For transition zone waters, spreadsheet prints the lesser of the fresh water and saltwater water quality criteria.
6. Regular WLA = (WQC x WLA multiplier) - (WLA multiplier - 1)(background conc.)
7. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
8. Antideg. WLA = (Antideg. Baseline)(WLA multiplier) - (WLA multiplier - 1)(background conc.)

Metal	Site Specific Target Value (SSTV)
Antimony	2.2E+05
Arsenic III	5.5E+01
Cadmium	3.2E+01
Chromium III	#VALUE!
Chromium VI	6.8E+02
Copper	7.4E+00
Lead	1.9E+02
Mercury	1.4E+00
Nickel	5.9E+01
Selenium	2.4E+02
Silver	1.6E+00
Zinc	7.2E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

6/30/04 8:48:12 PM

Facility = Omega (004-005) 995

Chemical = Copper

Chronic averaging period = 4

WLAa = 19

WLAc = 300

Q.L. = 4.7

samples/mo. = 2

samples/wk. = 1

Summary of Statistics:

observations = 12

Expected Value = 71.4509

Variance = 458.150

C.V. = 0.299568

97th percentile daily values = 118.803

97th percentile 4 day average = 93.5130

97th percentile 30 day average= 78.8017

< Q.L. = 0

Model used = lognormal

A limit is needed based on Acute Toxicity

Maximum Daily Limit = 19

Average Weekly limit = 19

Average Monthly LImit = 16.5787015065066

The data are:

66

72

73

75

74

73

72

90

53

52

36

117

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995

Facility = Omega (004/005)
Chemical = Silver
Chronic averaging period = 4
WLAa = 4
WLAc =
Q.L. = 1
# samples/mo. = 2
# samples/wk. = 1

Summary of Statistics:

observations = 8
Expected Value = 4.60375
Variance = 7.63002
C.V. = 0.6
97th percentile daily values = 11.2028
97th percentile 4 day average = 7.65967
97th percentile 30 day average= 5.55236
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 4
Average Weekly limit = 4
Average Monthly LImit = 3.25273595368957

The data are:

1.62
1.07
1.51
1.43
1.16
1.32
4.72
24

Attachment 9 – Whole Effluent Toxicity Testing Evaluation – Outfall 002

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road Glen Allen, VA 23060 804/527-5020

SUBJECT: Whole Effluent Toxicity (WET) Test Data Review
TO: Curtis J. Linderman, Water Permit Manager, PRO
FROM: Jaime Bauer, PRO
DATE: February 8, 2011
COPIES: Deborah DeBiasi, CO - WET

Facility Name:	Omega Proteins, Incorporated - Reedville
Number:	VA0003867
Receiving Stream	Cockrell Creek
Facility SIC:	2077
Current Outfall Descriptions:	Outfall 002 – Condensate and Boiler blowdown
	Outfall 995 – Non-contract Cooling Water
Discharge Location Description:	Tidal, Saltwater

FACILITY DESCRIPTION AND PERMIT REQUIREMENTS

The permit for the Omega Proteins plant located at 610 Menhaden Road, in Reedville, Virginia is in the process of reissuance. The facility processes menhaden by cooking the fish, pressing and separating the oil and solids, and evaporating the water to leave fish meal and oil. Wastewater associated with this type of fish processing includes Evaporator and Dryer Condensate, boiler blowdown, and non-contact cooling water. The permit issued on December 2, 2005 required Whole Effluent Toxicity (WET) testing on Outfalls 001, 002, and 003.

Outfall 995 consists of the combined discharge of non-contact cooling water from outfalls 004 and 005. The permittee was previously required to perform quarterly biological monitoring for Outfall 004 however that monitoring was dropped in 1997 because no toxicity was found. Outfall 005 was added after 1997 and no biological monitoring has historically been required based on the findings from Outfall 005. Since the discharge from Outfall 995 is not believed to be a potential source of toxicity, no WET monitoring was required.

Outfall 001

The 2005 permit authorized the discharge of contact cooling water at Outfall 001 generated from the operation of scrubbers used for air pollution control. At the end of the 2009 fishing season, the wet scrubbing system was removed and airless dryers where installed for the process which do not generate wastewater. Since outfall 001 has been eliminated, evaluation and analysis of data collected between 2006 and 2009 are not being included in this evaluation.

Outfall 002

Evaporator condensate is generated as wastewater as the plant processes fish. The condensate is treated through ammonia strippers, two aerated ponds, and is sent to a dissolved air floatation (DAF) unit and a UV disinfection unit and discharged from Outfall 002. Also, discharged from Outfall 002 is a small amount of boiler blowdown created from the operation of cookers and steam dryers.

The discharge from Outfall 002 has a WET limit of 14 acute toxic units (14 TU_a equivalent to an LC_{50} of 7.14) in Part I.A.6 of the 2005 permit based on previous demonstrations of potential toxicity from the discharge. The permit required that 24-hour flow proportioned composite samples be collected quarterly and specified that the 48 hour static tests using *Mysidopsis bahia* (now known as *Americamysis bahia)* be performed. All toxicity tests were performed by Coastal Bioanalysts, Inc. Quarters were defined on the facility's annual operating schedule as follows: Quarter 1: May-July, Quarter 2: August – October; Quarter

3: November – January; Quarter 4: February – April. No monitoring was required during quarters when no discharge occurred.

Outfall 003

The 2005 permit authorized the discharge of evaporation condensate generated from the fish processing plant into a quadrant of the Chesapeake Bay identified as Outfall 003 in case of an emergency. The facility has not discharged this type of process water in more than 20 years; however, the permit required WET testing be conducted if a discharge occurred. During the term of the 2005 permit, the permittee reported no discharges from Outfall 003; no WET testing was required.

DATA SUMMARY

Results from the quarterly monitoring for toxicity at Outfall 002 are shown in Table 1 below. All tests were performed in accordance with approved testing techniques. Acute toxicity test results indicate most tests showed compliance with acute toxicity limitation as contained in the 2005 permit. Quarter 2 of 2006 did not meet the limit the WET limit

Table 1: Quarterly *M. bahia* Acute WET Test Results for Outfall 002

Operating Year	Quarter	Date of Test	LC_{50}	TU_a
2006	1	06/15-17/2006	>100	<1.00
	2	08/17-19/2006	15.665	6.38
	3	11/17-19/2006	>100	<1.00
	4	*NO DISCHARGE DURING QUARTER*		
2007	1	06/20-22/2007	>100	<1.00
	2	08/03-05/2007	>100	<1.00
	3	11/07-09/2007	>100	<1.00
	4	*NO DISCHARGE DURING QUARTER*		
2008	1	07/16-18/2008	>100	<1.00
	2	09/03-05/2008	>100	<1.00
	3	12/03-05/2008	>100	<1.00
	4	*NO DISCHARGE DURING QUARTER*		
2009	1	06/23-26/2009	>100	<1.00
		07/08-10/2009	>100	<1.00
	2	09/08-10/2009	>100	<1.00
	3	11/10-12/2009	>100	<1.00
	4	*NO DISCHARGE DURING QUARTER*		
2010	1	06/03-05/2010	>100	<1.00
	2	09/08-10/2010	>100	<1.00

DISCUSSION AND DATA EVALUATION

The toxicity data was analyzed using the agency established WETLIM_2005.xls spreadsheet and the STATS.exe statistical software to determine if there is a need to adjust the acute and chronic endpoints or establish permit limitations for toxicity.

For Outfall 002, an acute and chronic dilution ratio of 1:100 are applied based on the 1998 CORMIX analysis and modeling results (See Attachment 7). Note that when "Y" is entered for "Diffuser/Model Study?" the plant and receiving stream flow information is not used in the endpoint and limitation evaluation. The plant flow is being included for informational purposes only and was obtained from the application Form 2C.

Based on results from the WETLIM_2005 evaluation, the acute instream waste concentration is

calculated as 1%. An acute toxicity limitation of 14 TU_a is appropriate for Outfall 002.

Using the wasteload allocations calculated in WETLIM_2005 and the acute toxicity data reported in toxic units (TU) as shown in the table above, the STAT.exe statistical software program was used to determine if a more stringent toxicity limitation may be required for Outfall 002.

Chemical = WET - TUa - Outfall 002 (*M. bahia*)
Chronic averaging period = 4
WLAa = 30
WLAc =
Q.L. = 1
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:
observations = 15
Expected Value = 1.26873
Variance = .414135
C.V. = 0.507225
97th percentile daily values = 2.78313
97th percentile 4 day average = 1.96694
97th percentile 30 day average= 1.48973
< Q.L. = 0
Model used = lognormal

No Limit is required for this material

The data are:

1	1	1
6.38	1	1
1	1	1
1	1	1
1	1	1

Statistical evaluation resulted in no recommended limitation on the basis of acute toxicity. However, the permit will retain the limitation of 14 TU_a in accordance with the agency anti-back sliding policy.

RECOMMENDATIONS

In accordance with TMP Guidance 2000 (DEQ Guidance Memo No. 00-2012), data evaluation, and best professional judgment, below is the recommended language for whole effluent toxicity limitation for inclusion in the permit.

Please note that the 2011 reissuance of the VPDES permit will not authorize discharges from Outfall 003; therefore, no WET testing for Outfall 003 will be included in the permit. Likewise, since the discharge from Outfall 001 has been eliminated, the WET language previously contained in the 2005 permit will not be carried forward in the 2011 permit reissuance. Since the discharge of non-contact cooling water is not believed to be a source of toxicity, no biological monitoring is proposed for Outfall 995.

WHOLE EFFLUENT TOXICITY (WET) LIMITATION REQUIREMENTS

1. The Whole Effluent Toxicity limitation of ≤14 TU_a (LC_{50} ≥7%) in Part I.A. is a final limit effective for Outfall 002 upon issuance of this permit.

2. Commencing within the first month after the effective date of this permit, the permittee shall conduct quarterly 48-Hour Static Test using *Americamysis bahia (*previously known as *Mysidopsis bahia)* using 24-hour flow-proportioned composite samples of final effluent from outfall 002.

   These acute tests are to be conducted using 5 geometric dilutions of effluent with a minimum of 4 replicates, with 5 organisms in each. Tests in which control survival is less than 90% are not acceptable.

One copy of the detailed report concerning the conduct of the test shall accompany the DMR on which the results are reported. Technical assistance in developing the procedures for these tests shall be provided by the DEQ, if requested by the permittee. Test procedures and reporting shall be in accordance with the WET testing methods cited in 40 CFR 136.3.

3. The test dilutions should be able to determine compliance with the following endpoints:

$$LC_{50} \text{ of } \geq 7\% \text{ equivalent to a } TU_a \text{ of } \leq 14$$

4. The permit may be modified or revoked and reissued to include pollutant specific limits in lieu of a WET limit should it be demonstrated that toxicity is due to specific parameters.

5. The monitoring quarters shall be defined by the seasonal operations of the facility as follows:

Quarter 1: May 1st –July 31st
Quarter 2: August 1st – October 31st
Quarter 3: November 1st – January 31st
Quarter 4: February 1st – April 30th

6. The permittee shall report the results on the quarterly DMR and submit a copy of each toxicity test report in accordance with the following schedule:

Test Period	Test Period Dates	DMR/Report Due Date
Quarter 1	May 1 – July 31, 2011	August 10, 2011
Quarter 2	August 1 – October 31, 2011	November 10, 2011
Quarter 3	November 1, 2011 – January 31, 2012	February 10, 2012
Quarter 4	February 1 – April 30, 2012	May 10, 2012
Quarter 5	May 1 – July 31, 2012	August 10, 2012
Quarter 6	August 1 – October 31, 2012	November 10, 2012
Quarter 7	November 1, 2012 – January 31, 2013	February 10, 2013
Quarter 8	February 1 – April 30, 2013	May 10, 2013
Quarter 9	May 1 – July 31, 2013	August 10, 2013
Quarter 10	August 1 – October 31, 2013	November 10, 2013
Quarter 11	November 1, 2013 – January 31, 2014	February 10, 2014
Quarter 12	February 1 – April 30, 2014	May 10, 2014
Quarter 13	May 1 – July 31, 2014	August 10, 2014
Quarter 14	August 1 – October 31, 2014	November 10, 2014
Quarter 15	November 1, 2014 – January 31, 2015	February 10, 2015
Quarter 16	February 1 – April 30, 2015	May 10, 2015
Quarter 17	May 1 – July 31, 2015	August 10, 2015
Quarter 18	August 1 – October 31, 2015	November 10, 2015
Quarter 19	November 1, 2015 – January 31, 2016	February 10, 2016
Quarter 20	February 1 – April 30, 2012	May 10, 2016

7. In the event that quarterly WET testing as required by Part I.A.1 of this permit is not possible due to lack of operations at the facility, the permittee shall submit a written notice to the DEQ Piedmont Regional Office with the DMR submitted for the month following the quarter in which the test was to have been performed

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 01/10/05
File: WETLIM10.xls
(MIX.EXE required also)

Enter data in the cells with blue type:

Entry Date:	06/07/11
Facility Name:	Omega Proteins Outfall 00
VPDES Number:	VA0003867
Outfall Number:	2
Plant Flow:	0.265 MGD
Acute 1Q10:	NA MGD
Chronic 7Q10:	NA MGD

Acute Endpoint/Permit Limit — **Use as LC_{50} in Special Condition, as TUa on DMR**

ACUTE	14.6267468	TUa	LC_{50} =	7	% Use as	14.28	TUa
ACUTE WLAa	30		Note: Inform the permittee that if the mean of the data exceeds this TUa:	4.10944543	a limit may result using WLA.EXE		

Chronic Endpoint/Permit Limit — **Use as NOEC in Special Condition, as TUc on DMR**

CHRONIC	146.257468	TU_c	NOEC =	1	% Use as	100.00	TU_c
BOTH*	300.000007	TU_c	NOEC =	1	% Use as	100.00	TU_c
AML	146.257468	TU_c	NOEC =	1	% Use as	100.00	TU_c

ACUTE WLAa,c	300	Note: Inform the permittee that if the mean	
CHRONIC WLAc	100	of the data exceeds this TUc:	60.1037272
* Both means acute expressed as chronic		a limit may result using WLA.EXE	

% Flow to be used from MIX.EXE			Diffuser /modeling study?			
			Enter Y/N	y		
100	%		Acute	100	:1	
100	%		Chronic	100	:1	

Are data available to calculate CV? (Y/N)	N	(Minimum of 10 data points, same species, needed)		Go to Page 2
Are data available to calculate ACR? (Y/N)	N	(NOEC<LC50, do not use greater/less than data)		Go to Page 3

IWC_a	1	%	Plant flow/plant flow + 1Q10
IWC_c	1	%	Plant flow/plant flow + 7Q10

NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use

Dilution, acute	100	100/IWCa
Dilution, chronic	100	100/IWCc
WLA_a	30	Instream criterion (0.3 TUa) X's Dilution, acute
WLA_c	100	Instream criterion (1.0 TUc) X's Dilution, chronic
$WLA_{a,c}$	300	ACR X's WLA_a - converts acute WLA to chronic units
ACR -acute/chronic ratio	10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)
CV-Coefficient of variation	0.6	Default of 0.6 - if data are available, use tables Page 2)
Constants eA	0.4109447	Default = 0.41
eB	0.6010373	Default = 0.60
eC	2.4334175	Default = 2.43
eD	2.4334175	Default = 2.43 (1 samp) No. of sample 1

**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.

$LTA_{a,c}$	123.28341	WLAa,c X's eA					
LTA_c	60.10373	WLAc X's eB				Rounded NOEC's	%
MDL** with $LTA_{a,c}$	300.0000074	TU_c	NOEC =	0.333333	(Protects from acute/chronic toxicity)	NOEC = 1	%
MDL** with LTA_c	146.2574684	TU_c	NOEC =	0.683726	(Protects from chronic toxicity)	NOEC = 1	%
AML with lowest LTA	146.2574684	TU_c	NOEC =	0.683726	Lowest LTA X's eD	NOEC = 1	

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a

						Rounded LC50's	%
MDL with $LTA_{a,c}$	30.00000074	TU_a	LC50 =	3.333333	%	LC50 = 4	%
MDL with LTA_c	14.62574684	TU_a	LC50 =	6.837258	%	LC50 = 7	

Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">") FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE 'CV' WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE 'CV' IS ANYTHING OTHER THAN 0.6.

Coefficient of Variation for effluent tests

CV = 0.6 (Default 0.6)

δ^2 = 0.3074847

δ = 0.554513029

Using the log variance to develop eA

(P. 100, step 2a of TSD)

Z = 1.881 (97% probability stat from table

A = -0.88929666

eA = 0.410944686

Using the log variance to develop eB

(P. 100, step 2b of TSD)

δ_4^2 = 0.086177696

δ_4 = 0.293560379

B = -0.50909823

eB = 0.601037335

Using the log variance to develop eC

(P. 100, step 4a of TSD)

δ^2 = 0.3074847

δ = 0.554513029

C = 0.889296658

eC = 2.433417525

Using the log variance to develop eD

(P. 100, step 4b of TSD)

n = 1 This number will most likely stay as "1", for 1 sample/month.

δ_n^2 = 0.3074847

δ_n = 0.554513029

D = 0.889296658

eD = 2.433417525

	Vertebrate IC_{25} Data or LC_{50} Data	LN of data	Invertebrate IC_{25} Data or LC_{50} Data	LN of data
	**********		**********	
1	0		0	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
St Dev	NEED DATA	NEED DATA	St Dev	NEED DATA NEED DATA
Mean	0	0	Mean	0 0
Variance	0	0.000000	Variance	0 0.000000
CV	0		CV	0

Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC_{50}, since the ACR divides the LC_{50} by the NOEC. LC_{50}'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Table 1. Result:	Vertebrate ACR	0
Table 2. Result:	Invertebrate ACR	0
	Lowest ACR	Default to 10

Table 2. ACR using Invertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

DILUTION SERIES TO RECOMMEND

Table 4.	Monitoring % Effluent	Monitoring TUc	Limit % Effluent	Limit TUc
Dilution series based on data mean	1.7	60.10373		
Dilution series to use for limit			1	100
Dilution factor to recommend:	0.128988		0.1	
Dilution series to recommend:	100.0	1.00	100.0	1.00
	12.9	7.75	10.0	10.00
	1.7	60.10	1.0	100.00
	0.2	465.96	0.1	1000.00
	0.03	3612.46	0.0	10000.00
Extra dilutions if needed	0.00	28006.16	0.0	100000.00
	0.00	217122.19	0.0	#########

Convert LC_{50}'s and NOEC's to Chronic TU's for use in WLA.EXE

Table 3. **ACR used: 10**

	Enter LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50, enter it here: NO DATA $\%LC_{50}$ NO DATA TUa

Cell: I9
Comment:
This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18
Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22
Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40
Comment:
If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41
Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48
Comment:
See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62
Comment:
Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62
Comment:
Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117
Comment: Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

Cell: M119
Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121
Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUa. The calculation is the same: 100/NOEC = TUc or 100/LC50 = TUa.

Cell: C138
Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

Attachment 10 – Ground Water Monitoring Data Evaluation

Groundwater Monitoring Data Analysis

Background

The permittee treats and discharges wastewater from the processing of menhaden fish. As part of the treatment train, the wastewater is detained in an aerated lagoon. The 2005 permit required that the permittee submit a plan for assessing impacts to groundwater by either performing a lagoon liner permeability test or establishing a groundwater monitoring plan. The permittee submitted a ground water monitoring plan that was approved by the DEQ Piedmont Regional Office on May 16, 2006. The plan identifies quarterly data collection from one up gradient monitoring well and five down gradient monitoring wells for the following parameters: aluminum, ammonia, chlorides, conductivity, copper, dissolved oxygen, E. coli, nitrate, pH, phosphorus, silver, total organic carbon (TOC), and turbidity.

Data Analysis

Data from 2007 through 2010 was analyzed using the Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance - to determine if the data was normally or non-normally distributed. If data was determined to be normally distributed the Student's T-test was used to determine whether or not there was a significant difference between the identified up gradient and down gradient wells for each parameter where the data was normally distributed. For those parameters where the data was not normally distributed, a non-parametric test was used to determine if the non-normal data demonstrated a significant difference in up gradient and down gradient data. A summary of the significant difference analysis is recorded in Table 1 below. Note that Well 1 is designated as the up gradient well for establishing background values.

Table 1 – Result of Significant Difference Test Between Up Gradient and Down Gradient Wells

	Well 2	Well 3	Well 4	Well 5	Well 6
Aluminum	**SD**	**SD**	**SD**	NSD	NSD
Ammonia	**SD**	NSD	NSD	NSD	NSD
Chlorides	**SD**	NSD	NSD	NSD	NSD
Conductivity	NSD	NSD	NSD	NSD	NSD
Copper	NSD	NSD	NSD	NSD	NSD
Dissolved Oxygen	NSD	**SD**	**SD**	**SD**	**SD**
E. coli	NSD	NSD	NSD	NSD	NSD
Nitrate	**SD**	**SD**	NSD	NSD	NSD
pH	NSD	NSD	NSD	**SD**	**SD**
Phosphorus	**SD**	**SD**	**SD**	**SD**	**SD**
Silver	All data reported below QL. Believed absent.				
TOC	NSD	NSD	NSD	NSD	NSD
Turbidity	NSD	NSD	**SD**	NSD	NSD

NSD = No significant difference in data from up gradient well
SD = Significant difference in the data from the up gradient well

For ammonia, nitrate, and pH, one or more reported values were greater than those listed in Table 2 (or outside of the range in the case of pH). See the attached analysis spreadsheets for detailed monitoring data analysis including reported values reported

Table 2 - Groundwater Quality Standards and Criteria

Parameter	Standard
Aluminum	None
Ammonia	0.025 mg/L
Chlorides [1], [2]	50 mg/L
Conductivity	None
Copper	1.0 mg/L
Dissolved Oxygen	None
E. coli	None
Nitrate	5.0 mg/L
pH	6.5 – 9.0 S.U.
Phosphorus	None
Silver	None
TOC [1]	10 mg/L
Turbidity	None

[1] Groundwater Criteria. No enforceable standard. Used as indicators of potential ground water contamination.

[2] Naturally occurring in the eastern part of the Coastal Plain province where the facility is located.

Discussion and Conclusion

The network of monitoring wells appears to be sufficient to monitor groundwater. Analysis of available data reveals that the wells down gradient at the Omega Protein facility have elevated levels of some monitored parameters Because the analysis indicates a significance difference between up gradient and down gradient parameter concentrations at several wells and reported values greater than the Virginia Groundwater Quality standards or criteria, it is recommended that the permittee submit a Corrective Action Plan (CAP) for approval by the DEQ Piedmont Regional Office to address potential groundwater impacts from the lagoon. Additionally, the permittee is proposing to remove use of the lagoon as a method of treatment with this permit reissuance. This will eliminate the source of contamination, if lagoon is impacting groundwater.

Ground Water Monitoring Data (2006-2010)

**NR: Not Reported

Turbidity (un)

Report	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6
2006Q2						
2006Q3						
2006Q4						
2007Q1						
2007Q2						
2007Q3						
2007Q4						
2008Q1						
2008Q2	51.7	14	0.01	NR	14	14.23
2008Q3	542	38.9	18.9	84	5	48.4
2008Q4	441	32.3	16.5	109	3.2	44.6
2009Q1	23.1	7.76	21.7	345	21.3	34.2
2009Q2	6.27	10.89	15.8	6.4	5.63	15.7
2009Q3	11.18	11.76	20	185	70	50
2009Q4	36.2	5.81	14.71	3.18	70.5	25.5
2010Q1	37.3	6.3	20.2	11.1	87	28
2010Q2	21.1	6.61	50.1	13.99	11.25	7.3
2010Q3	7.08	32.7	7.83	3.95	8.54	12.9
2010Q4	121	NR	169	717	179	3.06

pH (SU)

Report	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6
2006Q2	4.66	6.07	5.70	4.85	4.75	6.71
2006Q3	5.07	4.82	5.45	5.55	5.02	4.99
2006Q4	4.88	4.45	4.93	5.52	6.24	5.74
2007Q1	4.13	4.45	5.24	4.16	3.87	4.08
2007Q2	4.88	4.90	5.82	5.35	6.99	5.82
2007Q3	5.64	5.39	5.32	5.35	5.36	5.99
2007Q4	5.55	5.56	5.54	5.55	5.54	5.54
2008Q1	5.09	5.00	5.76	5.15	4.38	4.54
2008Q2	5.86	5.83	5.63	5.69	4.64	4.73
2008Q3	5.80	5.62	6.56	6.12	5.34	5.48
2008Q4	6.70	5.56	6.13	6.13	5.68	5.76
2009Q1	5.86	6.08	6.32	6.10	6.14	5.83
2009Q2	5.62	5.82	5.34	6.06	6.06	6.06
2009Q3	5.62	5.49	5.41	5.18	6.02	6.04
2009Q4	5.8	5.09	5.75	5.78	5.43	5.38
2010Q1	5.93	5.33	6.02	5.99	5.62	5.43
2010Q2	5.71	4.73	6.28	5.11	5.16	5.13
2010Q3	5.39	4.78	5.69	5.44	4.75	5.21
2010Q4	5.16	4.64	5.55	5.13	4.52	4.7

Conductivity (u/s)

2006Q2	658	1255	658	1282	581	1150
2006Q3	535	1371	518	201	369	147
2006Q4	565	945	278	160	455	129
2007Q1	517	780	307	136	391	115
2007Q2	513	586	283	165	249	124
2007Q3	556	1213	70	157	288	114
2007Q4	517	846	562	127	365	123
2008Q1	651	790	563	256	630	166
2008Q2	1072	764	1149	370	530	136
2008Q3	1047	1179	838	295	410	135
2008Q4	NR	1035	483	415	753	1065
2009Q1	226	1079	649	321	925	1236
2009Q2	1736	913	725	323	895	111
2009Q3	1417	1272	929	344	557	125
2009Q4	1167	1129	824	323	1157	158
2010Q1	998	1020	841	333	121	166
2010Q2	890	1402	360	195.5	448	122.7
2010Q3	1459	1590	709	250	721	117.3
2010Q4	1314	1231	671	201	827	125

Dissolved Oxygen (mg/L)

2006Q2	4.61	5.12	2.37	4.32	6.14	6.13
2006Q3	2.87	3.46	3.20	2.72	3.13	2.88
2006Q4	4.36	5.81	5.81	8.62	7.30	10.11
2007Q1	4.13	5.96	9.00	9.10	4.74	4.73
2007Q2	4.43	3.86	5.52	3.71	3.00	3.31
2007Q3	3.36	3.53	3.28	2.32	3.31	3.46
2007Q4	1.29	1.20	1.14	1.19	1.91	1.45
2008Q1	1.46	1.22	1.50	1.10	1.01	1.98
2008Q2	1.23	1.31	1.77	1.63	1.73	1.26
2008Q3	0.45	0.35	0.30	0.35	1.38	0.75
2008Q4	2.40	2.52	2.02	2.32	2.03	2.46
2009Q1	1.17	3.08	3.97	1.45	1.17	1.41
2009Q2	1.90	0.70	1.31	4.01	1.24	1.88
2009Q3	2.68	3.89	3.50	3.15	3.78	3.83
2009Q4	1.41	1.03	0.75	4.50	2.07	2.10
2010Q1	1.81	1.11	1.00	4.11	2.22	2.92
2010Q2	2.01	1.41	3.52	1.38	2.44	1.85
2010Q3	1.18	1.73	1.96	1.25	1.36	1.70
2010Q4	1.55	1.50	2.01	2.20	2.92	2.43

Temperature (°C)

2006Q2	16.1	16.5	17.3	16.8	16.4	16.9
2006Q3	21.1	21.0	22.5	22.8	24.6	22.4
2006Q4	17.6	17.3	17.3	17.9	15.6	15.8
2007Q1	13.0	11.9	9.9	14.0	10.2	9.8
2007Q2	15.5	15.2	19.4	15.7	18.8	17.3
2007Q3	21.7	22.1	23.0	22.1	25.7	23.5
2007Q4	20.1	19.1	19.1	19.5	19.0	18.8
2008Q1	13.2	12.8	12.8	13.6	11.7	11.3
2008Q2	15.2	15.5	16.4	16.3	16.5	16.0
2008Q3	19.6	19.6	22.1	19.7	24.6	19.1
2008Q4	16.1	16.2	13.7	16.9	15.0	14.5
2009Q1	13.0	12.1	9.0	13.0	11.2	11.3
2009Q2	15.4	14.7	16.7	16.0	15.8	15.2
2009Q3	15.1	15.6	16.1	16.3	16.4	16.3
2009Q4	12.3	12.7	10.8	12.5	9.0	9.8
2010Q1	12.2	14.1	11.6	13.7	12.7	12.4
2010Q2	11.9	11.5	11.6	12.4	12.6	14.6
2010Q3	18.2	18.7	22.4	21.4	22.3	21.6
2010Q4	15.9	15.0	14.1	16.0	14.5	13.9

Aluminum (mg/L)

2006Q2						
2006Q3						
2006Q4						
2007Q1						
2007Q2						
2007Q3						
2007Q4	56.4	97.5	117	124	48.5	15.5
2008Q1	19.5	40.7	21.1	52.7	8.41	7.56
2008Q2	25.6	50.8	50.4	52.2	10.1	5.29
2008Q3	21.4	45.3	68.4	86.5	29.3	3.71
2008Q4	1.39	90.6	53	102	33.5	14.7
2009Q1	13.5	29.2	18	21	16.7	3.18
2009Q2	2.05	46.9	68.8	53.8	19.6	16.7
2009Q3	4.92	0.435	0.491	18.9	38	7.19
2009Q4	2.6	7.22	2.18	11.7	5.58	0.858
2010Q1	1.1	2.73	1.98	1.65	4.97	5.6
2010Q2	3.52	0.8768	1.64	1.88	1.08	0.2632
2010Q3	0.8865	0.6682	<0.05	0.1938	1.75	2.75
2010Q4	0.93	9.04	0.2235	0.953	9.3	0.4368

Ground Water Monitoring Data (2006-2010)

Copper (mg/L)

Report	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6
2006Q2	0.043	0.058	<0.01	0.046	<0.01	0.02
2006Q3	0.035	0.035	<0.01	0.046	0.011	<0.01
2006Q4	0.035	0.038	<0.01	0.023	<0.01	<0.01
2007Q1	0.042	0.027	<0.01	0.026	<0.01	<0.01
2007Q2	0.02	0.017	<0.01	<0.01	<0.01	<0.01
2007Q3	0.028	0.072	0.062	0.067	0.048	<0.015
2007Q4	0.017	0.027	<0.01	0.043	0.018	<0.01
2008Q1	0.014	0.023	<0.01	0.029	<0.01	<0.01
2008Q2	0.022	0.032	0.022	0.029	<0.01	<0.01
2008Q3	0.018	0.016	<0.01	0.024	0.011	<0.01
2008Q4	0.012	0.052	0.025	0.058	0.018	<0.01
2009Q1	0.011	<0.01	<0.01	<0.01	<0.01	<0.01
2009Q2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2009Q3	0.21	<0.01	<0.01	<0.01	<0.01	<0.01
2009Q4	0.0117	<0.01	<0.01	<0.01	<0.01	<0.01
2010Q1	<0.01	<0.01	<0.01	0.012	<0.01	<0.01
2010Q2	0.0192	<0.01	<0.01	<0.01	<0.01	<0.01
2010Q3	0.0315	<0.01	<0.01	<0.01	<0.01	<0.01
2010Q4	0.0125	<0.01	<0.01	<0.01	<0.01	<0.01

Silver (mg/L)

Report	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6
2006Q2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2006Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2006Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2007Q1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2007Q2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2007Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2007Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2008Q1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2008Q2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2008Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2008Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2009Q1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2009Q2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2009Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2009Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2010Q1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2010Q2	Not Analyzed					
2010Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2010Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

E. coli (N/100mL)

Report	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6
2006Q2	<1	<1	<1	<1	<1	<1
2006Q3	48	2	3	<1	5	<1
2006Q4	<1	1	1	<1	<1	<1
2007Q1	<1	<1	<1	<1	<1	<1
2007Q2	<1	1	<1	<1	2	<1
2007Q3	1	<1	<1	<1	<1	<1
2007Q4	<1	<1	<1	<1	<1	<1
2008Q1	4	194	<1	<1	<1	<1
2008Q2	160	<1	<1	<1	<1	<1
2008Q3	3	<1	<1	<1	11	<1
2008Q4	6	<1	<1	<1	<1	<1
2009Q1	<1	<1	<1	<1	<1	<1
2009Q2	1	<1	<1	<1	<1	71
2009Q3	1410	<1	<1	<1	<1	<1
2009Q4	<1	<1	<1	<1	<1	<1
2010Q1	<1	<1	<1	<1	<1	<1
2010Q2	248	<1	<1	<1	<1	<1
2010Q3	>2400	<1	<1	<1	<1	<1
2010Q4	5	<1	<1	<1	<1	<1

Nitrate (mg/L)

Report	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6
2006Q2	<0.1	2.43	10.40	1.76	3.04	0.86
2006Q3	<0.1	5.21	10.10	1.66	3.15	0.34
2006Q4	<0.1	4.76	4.95	2.19	2.52	1.16
2007Q1	<0.1	4.93	8.28	2.23	2.97	0.96
2007Q2	<0.1	4.97	9.86	2.08	1.46	0.43
2007Q3	0.33	0.73	6.28	1.99	1.79	<0.1
2007Q4	2.78	4.87	3.02	7.30	0.92	0.88
2008Q1	0.92	10.50	3.90	4.16	5.73	1.20
2008Q2	0.50	8.90	5.00	3.50	6.20	0.60
2008Q3	0.50	3.40	10.50	2.50	1.60	0.50
2008Q4	1.80	9.00	7.10	3.90	2.80	0.50
2009Q1	0.30	9.40	9.30	3.70	2.90	0.40
2009Q2	1.30	10.30	14.50	4.00	4.00	0.50
2009Q3	<0.1	7.20	18.40	3.10	2.90	1.20
2009Q4	0.80	8.30	17.90	3.90	2.50	0.80
2010Q1	1.80	13.40	13.00	1.20	0.30	0.70
2010Q2	19.00	6.80	11.00	3.00	2.50	0.60
2010Q3	15.50	6.80	13.10	4.00	1.80	1.70
2010Q4	7.90	12.20	8.40	3.90	5.70	1.40

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Chloride (mg/L)

Report	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6
2006Q2	140	320	190	9.3	120	7.5
2006Q3	100	270	110	13	19	6.1
2006Q4	120	220	100	14	41	7.2
2007Q1	9.9	150	25	13	52	6.5
2007Q2	100	96	79	49	34	8.5
2007Q3	110	240	100	12	57	7.2
2007Q4	111	186	109	9.5	45	7.1
2008Q1	102	106	90.4	24.2	56.8	5.6
2008Q2	98.7	122	79.5	33.1	33.6	7.7
2008Q3	103	157	93.3	54.5	54.5	6.3
2008Q4	373	1.65	12.4	0.95	0.18	4.65
2009Q1	131	126	62.7	53	100	4.5
2009Q2	186	149	98.2	37.6	146	7.6
2009Q3	120	185	94.5	32.7	135	9.6
2009Q4	115	120	82.4	22.2	97.8	7.0
2010Q1	116	158	33.2	12.8	14.8	6.8
2010Q2	69.2	251	82.8	17.9	66.6	7.3
2010Q3	129	300	84.5	23.1	129	3.9
2010Q4	156	251	102	17.7	75.7	6.1

Ammonia (mg/L)

Report	Well 1	Well 2	Well 3	Well 4	Well 5	Well 6
2006Q2	12	60	2.2	0.12	2.98	0.23
2006Q3	12	25	1.55	<0.1	1.27	<0.01
2006Q4	16	22	1.4	<0.1	1.96	<0.1
2007Q1	29	37	0.67	0.14	3.39	0.24
2007Q2	14	6.82	2.05	<0.1	1.56	<0.1
2007Q3	10	22	1.27	<0.1	3.6	<0.1
2007Q4	11.7	19.6	1.45	<0.1	2.41	<0.1
2008Q1	8.9	8.89	0.55	<0.1	1.03	<0.1
2008Q2	10.3	10.4	1.07	<0.1	<0.1	<0.1
2008Q3	12	14.4	1.62	0.16	2.15	<0.05
2008Q4	1.65	12.4	0.95	0.18	4.65	<0.1
2009Q1	10.8	9.83	0.8	<0.1	2.97	<0.1
2009Q2	11.1	8.21	1.67	<0.1	2.32	<0.1
2009Q3	3.49	11.3	0.95	<0.1	1.11	<0.1
2009Q4	0.53	8.08	0.68	<0.1	3.34	<0.1
2010Q1	3.41	8.52	0.25	<0.1	0.6	<0.1
2010Q2	0.21	9.23	0.33	<0.1	2.73	<0.1
2010Q3	6.62	11.5	0.64	<0.1	5.23	<0.1
2010Q4	13.5	9.72	1.21	<0.1	1.66	<0.1

TOC (mg/L)

2006Q2	1.4	2.1	1.1	<1	1.9	2,2
2006Q3	71	3.5	3.6	2.4	2.7	1.5
2006Q4	3.1	2.9	1.5	2.3	3	1.6
2007Q1	2.7	3.4	2.1	1.8	1.8	1.3
2007Q2	3.1	4.8	2.5	2.1	4.5	1.9
2007Q3	2.6	4.6	3	3.4	3.9	1.5
2007Q4	3.6	4.3	1	1.9	2.1	1.4
2008Q1	6.9	5.5	2.1	2.7	2.4	1.4
2008Q2	5.9	4.8	2.1	2.2	1.7	1.8
2008Q3	4.1	4.1	2.1	2.1	2.1	1.5
2008Q4	17.8	5.3	2.5	2.1	2.3	1.6
2009Q1	5.1	4.7	2.4	2.1	2.5	1.9
2009Q2	7.4	4.4	2.4	2	2.5	1.8
2009Q3	36.7	4.3	1.7	2.1	2.1	1.8
2009Q4	29.2	4.2	1.2	2.5	1.8	1.2
2010Q1	19.8	4.4	1.1	2.6	6.3	1.1
2010Q2	43	4.8	1	1.1	2.9	2.6
2010Q3	55.2	4.9	1.7	1.2	2.8	3.9
2010Q4	27.5	3.5	1.5	2.6	4.1	2.8

Phosphorus (mg/L)

2006Q2	<0.05	0.11	0.79	<0.05	<0.05	0.31
2006Q3	0.62	0.59	0.47	0.15	0.08	<0.05
2006Q4	0.26	0.33	0.16	0.24	0.16	0.12
2007Q1	0.18	0.3	0.19	0.06	0.15	0.12
2007Q2	0.27	0.16	0.31	0.54	0.16	0.22
2007Q3	0.49	2.4	2.14	3.29	2.37	0.13
2007Q4	0.4	1.65	0.23	0.68	<0.05	0.37
2008Q1	0.26	0.211	<0.5	0.14	0.1	0.1
2008Q2	0.3	0.16	0.47	<0.05	0.12	<0.05
2008Q3	0.25	0.25	0.29	0.12	0.26	0.16
2008Q4	0.26	0.32	0.12	2.7	0.07	0.64
2009Q1	0.32	0.47	0.17	0.11	0.12	0.19
2009Q2	0.04	0.22	0.1	0.11	0.08	0.16
2009Q3	0.08	<0.01	0.19	0.15	0.08	<0.01
2009Q4	0.11	0.04	0.03	0.07	0.02	0.02
2010Q1	0.23	0.02	0.06	0.05	0.12	0.13
2010Q2	0.4	0.69	0.07	0.04	0.09	0.12
2010Q3	0.17	0.03	0.07	0.13	0.04	0.11
2010Q4	0.21	0.17	0.04	0.13	0.12	0.24

Groundwater Data and Analysis Summary for Aluminum

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Aluminum	Units:	mg/L
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are NOT normally distributed. Use Non-Normal Test	YES		
Well 3	Data are NOT normally distributed. Use Non-Normal Test	YES		
Well 4	Data are NOT normally distributed. Use Non-Normal Test	YES		
Well 5	Data are normally distributed. Use T-Test.	NO		
Well 6	Data are normally distributed. Use T-Test.	NO		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2007Q4	56.4	97.5	117	124	48.5	15.5
2	2008Q1	19.5	40.7	21.1	52.7	8.41	7.56
3	2008Q2	25.6	50.8	50.4	52.2	10.1	5.29
4	2008Q3	21.4	45.3	68.4	86.5	29.3	3.71
5	2008Q4	1.39	90.6	53	102	33.5	14.7
6	2009Q1	13.5	29.2	18	21	16.7	3.18
7	2009Q2	2.05	46.9	68.8	53.8	19.6	16.7
8	2009Q3	4.92	0.435	0.491	18.9	38	7.19
9	2009Q4	2.6	7.22	2.18	11.7	5.58	0.858
10	2010Q1	1.1	2.73	1.98	1.65	4.97	5.6
11	2010Q2	3.52	0.8768	1.64	1.88	1.08	0.2632
12	2010Q3	0.8865	0.6682	<0.05	0.1938	1.75	2.75
13	2010Q4	0.93	9.04	0.2235	0.953	9.3	0.4368
14							
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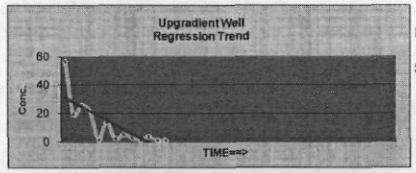
38							
39							
40							
	St.Dev. ►	16.05	33.54	37.33	42.03	15.28	5.75
	Mean ►	11.83	32.46	33.60	40.58	17.45	6.44
	Is the Mean greater than 3X St.Dev. ? ►	NO	NO	NO	NO	NO	NO

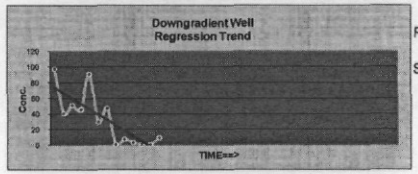
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



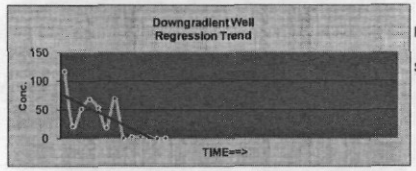
R-Sq. =
Slope =

Well 2



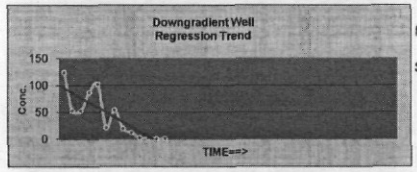
R-Sq. =
Slope =

Well 3



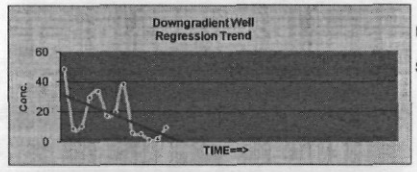
R-Sq. =
Slope =

Well 4



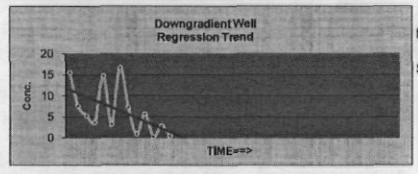
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for Ammonia

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Ammonia	Units:	mg/L
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are NOT normally distributed. Use Non-Normal Test	YES		
Well 3	Data are normally distributed. Use T-Test.	NO		
Well 4	Data are NOT normally distributed. Use Non-Normal Test	NO		
Well 5	Data are normally distributed. Use T-Test.	NO		
Well 6	Data are NOT normally distributed. Use Non-Normal Test	NO		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	12	60	2.2	0.12	2.98	0.23
2	2006Q3	12	25	1.55	0	1.27	0
3	2006Q4	16	22	1.4	0	1.96	0
4	2007Q1	29	37	0.67	0.14	3.39	0
5	2007Q2	14	6.82	2.05	0	1.56	0
6	2007Q3	10	22	1.27	0	3.6	0
7	2007Q4	11.7	19.6	1.45	0	2.41	0
8	2008Q1	8.9	8.89	0.55	0	1.03	0
9	2008Q2	10.3	10.4	1.07	0	0	0
10	2008Q3	12	14.4	1.62	0.16	2.15	0
11	2008Q4	1.65	12.4	0.95	0.18	4.65	0
12	2009Q1	10.8	9.83	0.8	0	2.97	0
13	2009Q2	11.1	8.21	1.67	0	2.32	0
14	2009Q3	3.49	11.3	0.95	0	1.11	0
15	2009Q4	0.53	8.08	0.68	0	3.34	0
16	2010Q1	3.41	8.52	0.25	0	0.6	0
17	2010Q2	0.21	9.23	0.33	0	2.73	0
18	2010Q3	6.62	11.5	0.64	0	5.23	0
19	2010Q4	13.5	9.72	1.21	0	1.66	0
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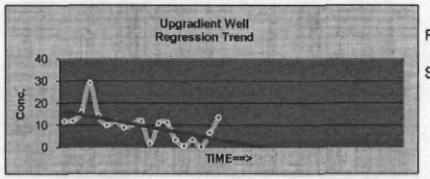
37							
38							
39							
40							
	St.Dev. ►	6.65	13.05	0.55	0.06	1.34	0.05
	Mean ►	9.85	16.57	1.12	0.03	2.37	0.01
	Is the Mean greater than 3X St.Dev. ? ►	NO	NO	NO	NO	NO	NO

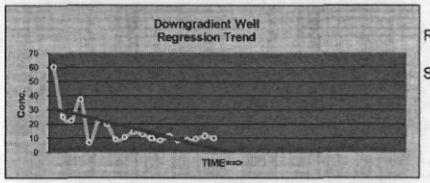
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



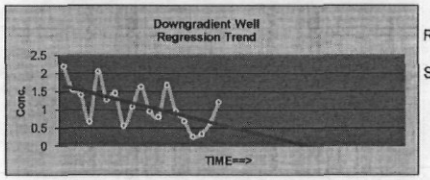
R-Sq. =
Slope =

Well 2



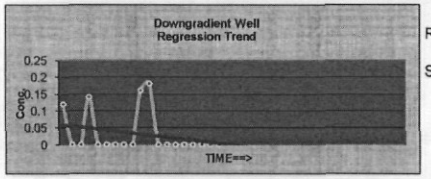
R-Sq. =
Slope =

Well 3



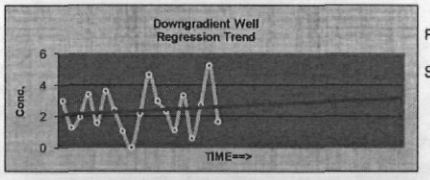
R-Sq. =
Slope =

Well 4



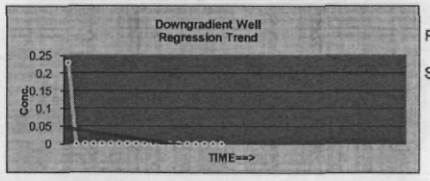
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for Chlroide

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Chlroide	Units:	mg/L
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are normally distributed. Use T-Test.	YES		
Well 3	Data are NOT normally distributed. Use Non-Normal Test	NO		
Well 4	Data are normally distributed. Use T-Test.	NO		
Well 5	Data are normally distributed. Use T-Test.	NO		
Well 6	Data are NOT normally distributed. Use Non-Normal Test	NO		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	140	320	190	9.3	120	7.5
2	2006Q3	100	270	110	13	19	6.1
3	2006Q4	120	220	100	14	41	7.2
4	2007Q1	9.9	150	25	13	52	6.5
5	2007Q2	100	96	79	49	34	8.5
6	2007Q3	110	240	100	12	57	7.2
7	2007Q4	111	186	109	9.5	45	7.1
8	2008Q1	102	106	90.4	24.2	56.8	5.6
9	2008Q2	98.7	122	79.5	33.1	33.6	7.7
10	2008Q3	103	157	93.3	54.5	54.5	6.3
11	2008Q4	373	1.65	12.4	0.95	0.18	4.65
12	2009Q1	131	126	62.7	53	100	4.5
13	2009Q2	186	149	98.2	37.6	146	7.6
14	2009Q3	120	185	94.5	32.7	135	9.6
15	2009Q4	115	120	82.4	22.2	97.8	7.0
16	2010Q1	116	158	33.2	12.8	14.8	6.8
17	2010Q2	69.2	251	82.8	17.9	66.6	7.3
18	2010Q3	129	300	84.5	23.1	129	3.9
19	2010Q4	156	251	102	17.7	75.7	6.1
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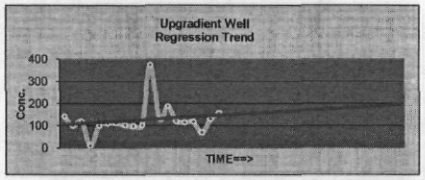
39							
40							
	St.Dev. ►	69.29	79.77	37.60	15.61	42.87	1.38
	Mean ►	125.78	179.40	85.73	23.66	67.26	6.69
	Is the Mean greater than 3X St.Dev. ? ►	NO	NO	NO	NO	NO	YES

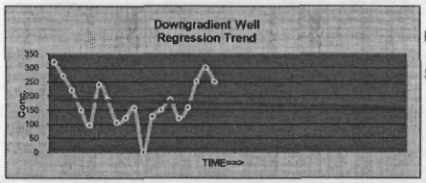
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



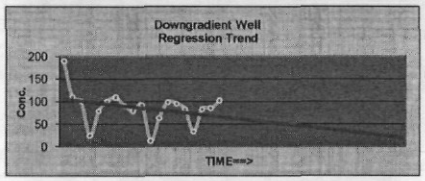
R-Sq. =
Slope =

Well 2



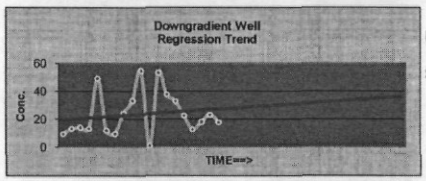
R-Sq. =
Slope =

Well 3



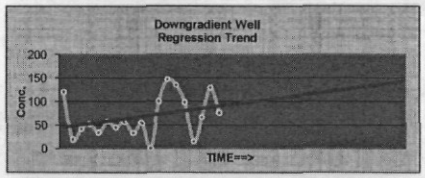
R-Sq. =
Slope =

Well 4



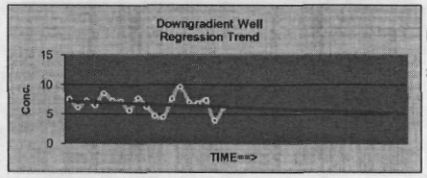
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for Conductivity

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Conductivity	Units:	u/s
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are NOT normally distributed. Use Non-Normal Test	NO		
Well 3	Data are normally distributed. Use T-Test.	NO		
Well 4	Data are NOT normally distributed. Use Non-Normal Test	NO		
Well 5	Data are normally distributed. Use T-Test.	NO		
Well 6	Data are NOT normally distributed. Use Non-Normal Test	NO		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	658	1255	658	1282	581	1150
2	2006Q3	535	1371	518	201	369	147
3	2006Q4	565	945	278	160	455	129
4	2007Q1	517	780	307	136	391	115
5	2007Q2	513	586	283	165	249	124
6	2007Q3	556	1213	70	157	288	114
7	2007Q4	517	846	562	127	365	123
8	2008Q1	651	790	563	256	630	166
9	2008Q2	1072	764	1149	370	530	136
10	2008Q3	1047	1179	838	295	410	135
11	2009Q1	226	1079	649	321	925	1236
12	2009Q2	1736	913	725	323	895	111
13	2009Q3	1417	1272	929	344	557	125
14	2009Q4	1167	1129	824	323	1157	158
15	2010Q1	998	1020	841	333	121	166
16	2010Q2	890	1402	360	195.5	448	122.7
17	2010Q3	1459	1590	709	250	721	117.3
18	2010Q4	1314	1231	671	201	827	125
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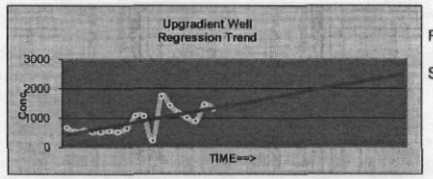
36							
37							
38							
39							
40							
	St.Dev. ►	417.04	264.66	271.15	257.10	267.50	343.80
	Mean ►	879.89	1075.83	607.44	302.19	551.06	250.00
	Is the Mean greater than 3X St.Dev. ? ►	NO	YES	NO	NO	NO	NO

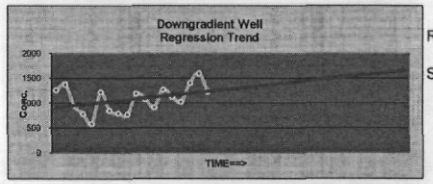
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



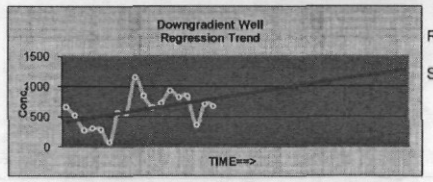
R-Sq. =
Slope =

Well 2



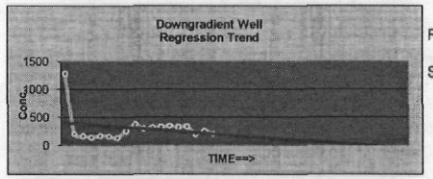
R-Sq. =
Slope =

Well 3



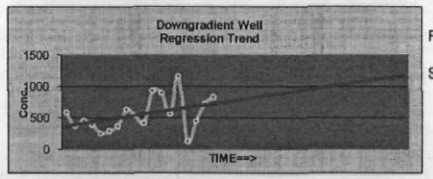
R-Sq. =
Slope =

Well 4



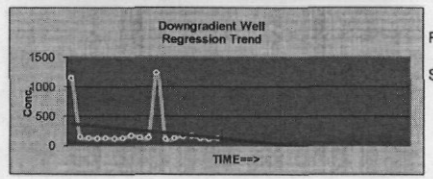
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for Copper

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Copper	Units:	mg/L
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 3	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 4	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 5	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 6	Data are NOT normally distributed, Use Non-Normal Test	NO		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	0.043	0.058	0.01	0.046	0.01	0.02
2	2006Q3	0.035	0.035	0.01	0.046	0.011	0.01
3	2006Q4	0.035	0.038	0.01	0.023	0.01	0.01
4	2007Q1	0.042	0.027	0.01	0.026	0.01	0.01
5	2007Q2	0.02	0.017	0.01	0.01	0.01	0.01
6	2007Q3	0.028	0.072	0.062	0.067	0.048	0.015
7	2007Q4	0.017	0.027	0.01	0.043	0.018	0.01
8	2008Q1	0.014	0.023	0.01	0.029	0.01	0.01
9	2008Q2	0.022	0.032	0.022	0.029	0.01	0.01
10	2008Q3	0.018	0.016	0.01	0.024	0.011	0.01
11	2008Q4	0.012	0.052	0.025	0.058	0.018	0.01
12	2009Q1	0.011	0.01	0.01	0.01	0.01	0.01
13	2009Q2	0.01	0.01	0.01	0.01	0.01	0.01
14	2009Q3	0.21	0.01	0.01	0.01	0.01	0.01
15	2009Q4	0.0117	0.01	0.01	0.01	0.01	0.01
16	2010Q1	0.01	0.01	0.01	0.012	0.01	0.01
17	2010Q2	0.0192	0.01	0.01	0.01	0.01	0.01
18	2010Q3	0.0315	0.01	0.01	0.01	0.01	0.01
19	2010Q4	0.0125	0.01	0.01	0.01	0.01	0.01
20							
21							
22							
23							
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31							
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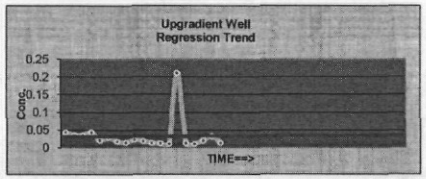
36							
37							
38							
39							
40							
	St.Dev. ►	0.04	0.02	0.01	0.02	0.01	0.00
	Mean ►	0.03	0.03	0.01	0.03	0.01	0.01
	Is the Mean greater than 3X St.Dev. ? ►	NO	NO	NO	NO	NO	YES

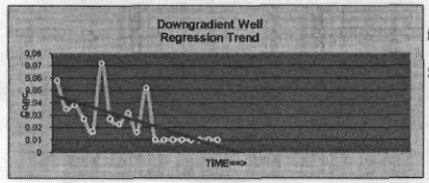
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



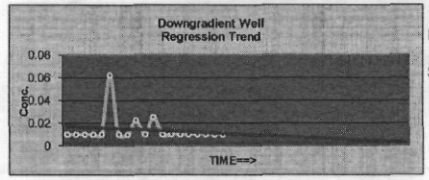
R-Sq. =
Slope =

Well 2



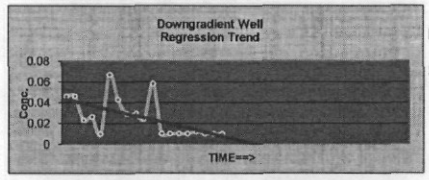
R-Sq. =
Slope =

Well 3



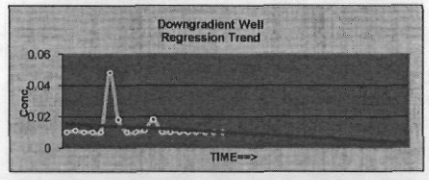
R-Sq. =
Slope =

Well 4



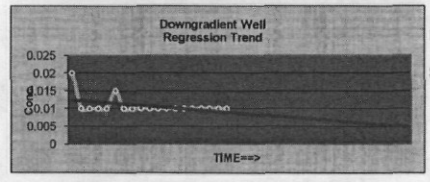
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for Dissolved Oxygen

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Dissolved Oxygen	Units:	mg/L
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are normally distributed. Use T-Test.	NO		
Well 3	Data are NOT normally distributed. Use Non-Normal Test	YES		
Well 4	Data are NOT normally distributed. Use Non-Normal Test	YES		
Well 5	Data are NOT normally distributed. Use Non-Normal Test	YES		
Well 6	Data are NOT normally distributed. Use Non-Normal Test	YES		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	4.61	5.12	2.37	4.32	6.14	6.13
2	2006Q3	2.87	3.46	3.20	2.72	3.13	2.88
3	2006Q4	4.36	5.81	5.81	8.62	7.30	10.11
4	2007Q1	4.13	5.96	9.00	9.10	4.74	4.73
5	2007Q2	4.43	3.86	5.52	3.71	3.00	3.31
6	2007Q3	3.36	3.53	3.28	2.32	3.31	3.46
7	2007Q4	1.29	1.20	1.14	1.19	1.91	1.45
8	2008Q1	1.46	1.22	1.50	1.10	1.01	1.98
9	2008Q2	1.23	1.31	1.77	1.63	1.73	1.26
10	2008Q3	0.45	0.35	0.30	0.35	1.38	0.75
11	2008Q4	2.40	2.52	2.02	2.32	2.03	2.46
12	2009Q1	1.17	3.08	3.97	1.45	1.17	1.41
13	2009Q2	1.90	0.70	1.31	4.01	1.24	1.88
14	2009Q3	2.68	3.89	3.50	3.15	3.78	3.83
15	2009Q4	1.41	1.03	0.75	4.50	2.07	2.10
16	2010Q1	1.81	1.11	1.00	4.11	2.22	2.92
17	2010Q2	2.01	1.41	3.52	1.38	2.44	1.85
18	2010Q3	1.18	1.73	1.96	1.25	1.36	1.70
19	2010Q4	1.55	1.50	2.01	2.20	2.92	2.43
20							
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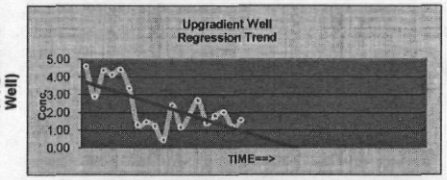
40							
	St.Dev. ►	1.28	1.75	2.12	2.37	1.71	2.16
	Mean ►	2.33	2.57	2.84	3.13	2.78	2.98
	Is the Mean greater than 3X St.Dev. ? ►	NO	NO	NO	NO	NO	NO

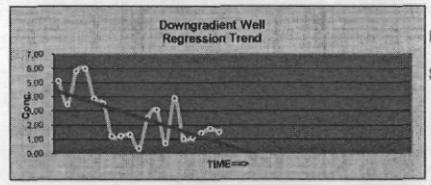
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



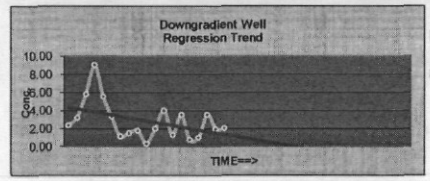
R-Sq. =
Slope =

Well 2



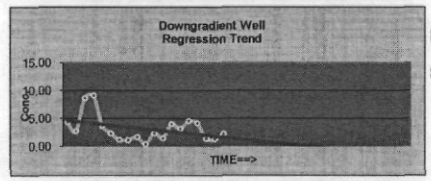
R-Sq. =
Slope =

Well 3



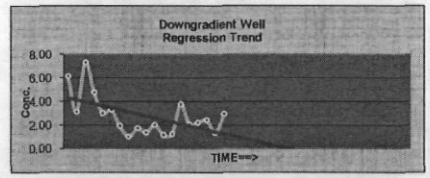
R-Sq. =
Slope =

Well 4



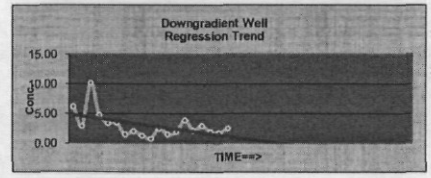
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for E. coli

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	E. coli	Units:	N/100mL
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 3	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 4	Data are normally distributed. Use T-Test.	NO		
Well 5	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 6	Data are NOT normally distributed, Use Non-Normal Test	NO		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	0	0	0	0	0	0
2	2006Q3	48	2	3	0	5	0
3	2006Q4	0	1	1	0	0	0
4	2007Q1	0	0	0	0	0	0
5	2007Q2	0	1	0	0	2	0
6	2007Q3	1	0	0	0	0	0
7	2007Q4	0	0	0	0	0	0
8	2008Q1	4	194	0	0	0	0
9	2008Q2	160	0	0	0	0	0
10	2008Q3	3	0	0	0	11	0
11	2008Q4	6	0	0	0	0	0
12	2009Q1	0	0	0	0	0	0
13	2009Q2	1	0	0	0	0	71
14	2009Q3	1410	0	0	0	0	0
15	2009Q4	0	0	0	0	0	0
16	2010Q1	0	0	0	0	0	0
17	2010Q2	248	0	0	0	0	0
18	2010Q3	2400	0	0	0	0	0
19	2010Q4	5	0	0	0	0	0
20							
21							
22							
23							
24							
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30							
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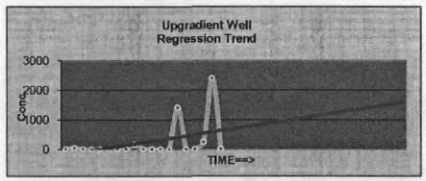
34							
35							
36							
37							
38							
39							
40							
	St.Dev. ►	617.83	44.46	0.71	0.00	2.72	16.29
	Mean ►	225.58	10.42	0.21	0.00	0.95	3.74
	Is the Mean greater than 3X St.Dev. ? ►	NO	NO	NO	NO	NO	NO

Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

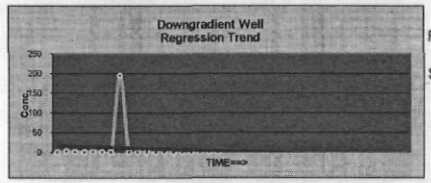
Well 1 (Upgradient Well)



R-Sq. =

Slope =

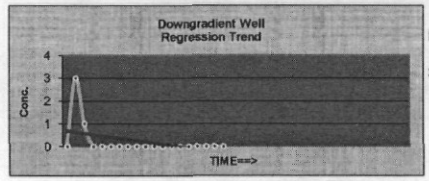
Well 2



R-Sq. =

Slope =

Well 3



R-Sq. =

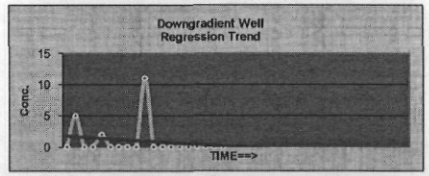
Slope =

Well 4

R-Sq. =

Slope =

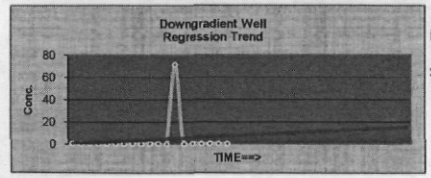
Well 5



R-Sq. =

Slope =

Well 6



R-Sq. =

Slope =

Groundwater Data and Analysis Summary for Nitrate

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Nitrate	Units:	mg/L
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are normally distributed. Use T-Test.	YES		
Well 3	Data are normally distributed. Use T-Test.	YES		
Well 4	Data are NOT normally distributed. Use Non-Normal Test	NO		
Well 5	Data are normally distributed. Use T-Test.	NO		
Well 6	Data are normally distributed. Use T-Test.	NO		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	0.00	2.43	10.40	1.76	3.04	0.86
2	2006Q3	0.00	5.21	10.10	1.66	3.15	0.34
3	2006Q4	0.00	4.76	4.95	2.19	2.52	1.16
4	2007Q1	0.00	4.93	8.28	2.23	2.97	0.96
5	2007Q2	0.00	4.97	9.86	2.08	1.46	0.43
6	2007Q3	0.33	0.73	6.28	1.99	1.79	0.00
7	2007Q4	2.78	4.87	3.02	7.30	0.92	0.88
8	2008Q1	0.92	10.50	3.90	4.16	5.73	1.20
9	2008Q2	0.50	8.90	5.00	3.50	6.20	0.60
10	2008Q3	0.50	3.40	10.50	2.50	1.60	0.50
11	2008Q4	1.80	9.00	7.10	3.90	2.80	0.50
12	2009Q1	0.30	9.40	9.30	3.70	2.90	0.40
13	2009Q2	1.30	10.30	14.50	4.00	4.00	0.50
14	2009Q3	0.00	7.20	18.40	3.10	2.90	1.20
15	2009Q4	0.80	8.30	17.90	3.90	2.50	0.80
16	2010Q1	1.80	13.40	13.00	1.20	0.30	0.70
17	2010Q2	19.00	6.80	11.00	3.00	2.50	0.60
18	2010Q3	15.50	6.80	13.10	4.00	1.80	1.70
19	2010Q4	7.90	12.20	8.40	3.90	5.70	1.40
20							
21							
22							
23							
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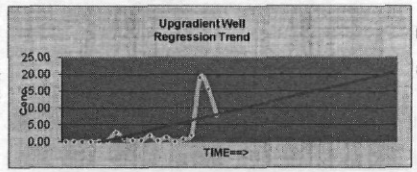
39							
40							
	St.Dev. ►	5.43	3.34	4.32	1.38	1.59	0.42
	Mean ►	2.81	7.06	9.74	3.16	2.88	0.78
	Is the Mean greater than 3X St.Dev. ? ►	NO	NO	NO	NO	NO	NO

Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

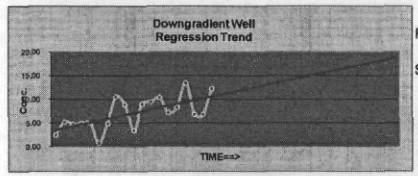
Well 1 (Upgradient Well)



R-Sq. =

Slope =

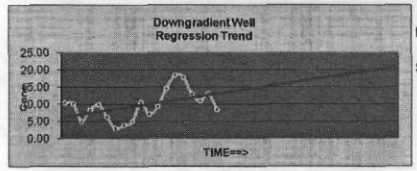
Well 2



R-Sq. =

Slope =

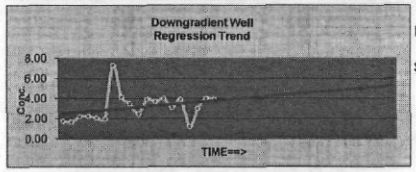
Well 3



R-Sq. =

Slope =

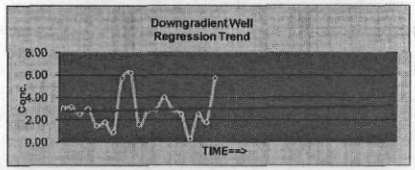
Well 4



R-Sq. =

Slope =

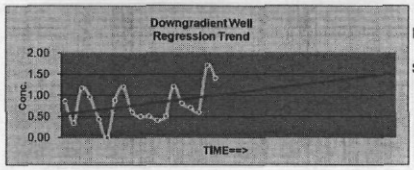
Well 5



R-Sq. =

Slope =

Well 6



R-Sq. =

Slope =

Groundwater Data and Analysis Summary for pH

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	pH	Units:	S.U.
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

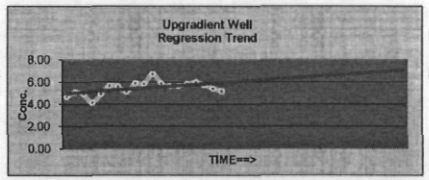
	Kolmorogov-Smimov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 3	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 4	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 5	Data are NOT normally distributed, Use Non-Normal Test	YES-Lower Range		
Well 6	Data are NOT normally distributed, Use Non-Normal Test	YES-Lower Range		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	4.66	6.07	5.70	4.85	4.75	6.71
2	2006Q3	5.07	4.82	5.45	5.55	5.02	4.99
3	2006Q4	4.88	4.45	4.93	5.52	6.24	5.74
4	2007Q1	4.13	4.45	5.24	4.16	3.87	4.08
5	2007Q2	4.88	4.90	5.82	5.35	6.99	5.82
6	2007Q3	5.64	5.39	5.32	5.35	5.36	5.99
7	2007Q4	5.55	5.56	5.54	5.55	5.54	5.54
8	2008Q1	5.09	5.00	5.76	5.15	4.38	4.54
9	2008Q2	5.86	5.83	5.63	5.69	4.64	4.73
10	2008Q3	5.80	5.62	6.56	6.12	5.34	5.48
11	2008Q4	6.70	5.56	6.13	6.13	5.68	5.76
12	2009Q1	5.86	6.08	6.32	6.10	6.14	5.83
13	2009Q2	5.62	5.82	5.34	6.06	6.06	6.06
14	2009Q3	5.62	5.49	5.41	5.18	6.02	6.04
15	2009Q4	5.8	5.09	5.75	5.78	5.43	5.38
16	2010Q1	5.93	5.33	6.02	5.99	5.62	5.43
17	2010Q2	5.71	4.73	6.28	5.11	5.16	5.13
18	2010Q3	5.39	4.78	5.69	5.44	4.75	5.21
19	2010Q4	5.16	4.64	5.55	5.13	4.52	4.7
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
	St.Dev. ►	0.57	0.53	0.41	0.51	0.76	0.63
	Mean ►	5.44	5.24	5.71	5.48	5.34	5.43
	Is the Mean greater than 3X St.Dev. ? ►	YES	YES	YES	YES	YES	YES

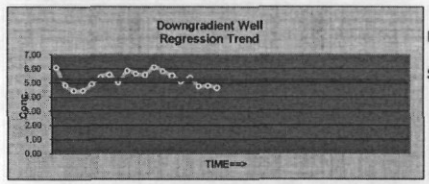
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



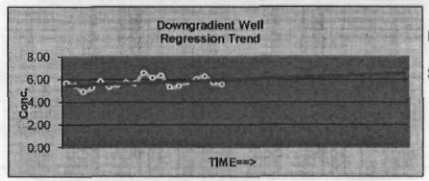
R-Sq. =
Slope =

Well 2



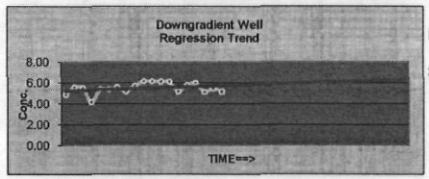
R-Sq. =
Slope =

Well 3



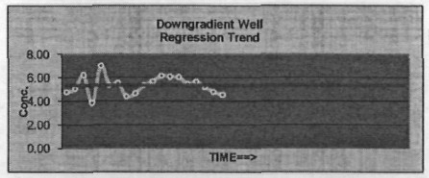
R-Sq. =
Slope =

Well 4



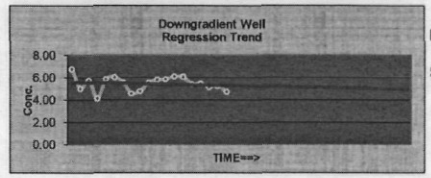
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for Phosphorous

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Phosphorous	Units:	mg/L
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are NOT normally distributed, Use Non-Normal Test	YES		
Well 3	Data are NOT normally distributed, Use Non-Normal Test	YES		
Well 4	Data are NOT normally distributed, Use Non-Normal Test	YES		
Well 5	Data are NOT normally distributed, Use Non-Normal Test	YES		
Well 6	Data are NOT normally distributed, Use Non-Normal Test	YES		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	0	0.11	0.79	0	0	0.31
2	2006Q3	0.62	0.59	0.47	0.15	0.08	0
3	2006Q4	0.26	0.33	0.16	0.24	0.16	0.12
4	2007Q1	0.18	0.3	0.19	0.06	0.15	0.12
5	2007Q2	0.27	0.16	0.31	0.54	0.16	0.22
6	2007Q3	0.49	2.4	2.14	3.29	2.37	0.13
7	2007Q4	0.4	1.65	0.23	0.68	0	0.37
8	2008Q1	0.26	0.211	<0.5	0.14	0.1	0.1
9	2008Q2	0.3	0.16	0.47	0	0.12	0
10	2008Q3	0.25	0.25	0.29	0.12	0.26	0.16
11	2008Q4	0.26	0.32	0.12	2.7	0.07	0.64
12	2009Q1	0.32	0.47	0.17	0.11	0.12	0.19
13	2009Q2	0.04	0.22	0.1	0.11	0.08	0.16
14	2009Q3	0.08	0	0.19	0.15	0.08	0
15	2009Q4	0.11	0.04	0.03	0.07	0.02	0.02
16	2010Q1	0.23	0.02	0.06	0.05	0.12	0.13
17	2010Q2	0.4	0.69	0.07	0.04	0.09	0.12
18	2010Q3	0.17	0.03	0.07	0.13	0.04	0.11
19	2010Q4	0.21	0.17	0.04	0.13	0.12	0.24
20							
21							
22							
23							
24							
25							
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32							
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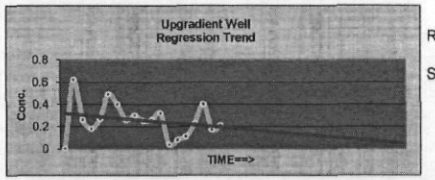
36							
37							
38							
39							
40							
	St.Dev. ►	0.15	0.61	0.48	0.92	0.52	0.15
	Mean ►	0.26	0.43	0.33	0.46	0.22	0.17
	Is the Mean greater than 3X St.Dev. ? ►	NO	NO	NO	NO	NO	NO

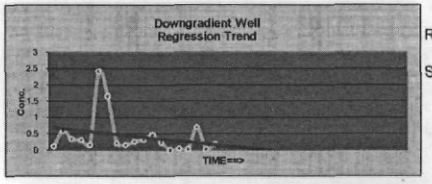
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



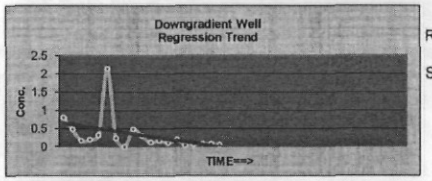
R-Sq. =
Slope =

Well 2



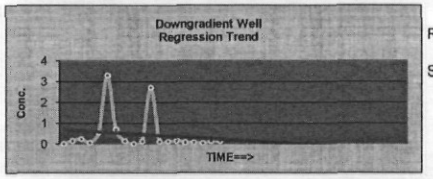
R-Sq. =
Slope =

Well 3



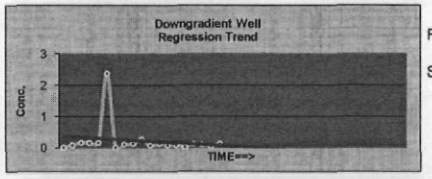
R-Sq. =
Slope =

Well 4



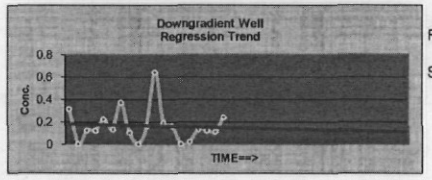
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for Silver

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Silver	Units:	mg/L
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

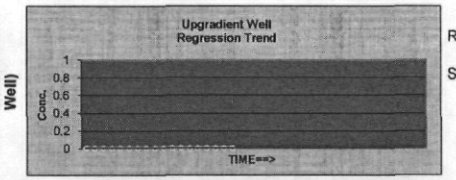
	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2				
Well 3				
Well 4				
Well 5				
Well 6				

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2	2006Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
3	2006Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4	2007Q1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5	2007Q2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6	2007Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7	2007Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
8	2008Q1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	2008Q2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
10	2008Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
11	2008Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
12	2009Q1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
13	2009Q2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
14	2009Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
15	2009Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
16	2010Q1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
17	2010Q3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
18	2010Q4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
	St.Dev. ►	0.00	0.00	0.00	0.00	0.00	0.00
	Mean ►	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Is the Mean greater than 3X St.Dev. ? ►	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

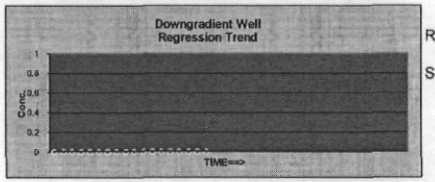
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



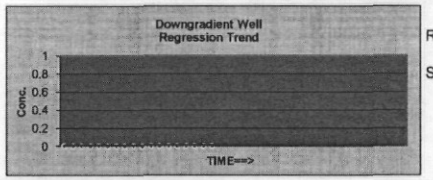
R-Sq. =
Slope =

Well 2



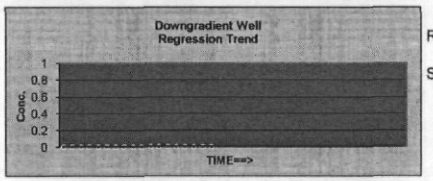
R-Sq. =
Slope =

Well 3



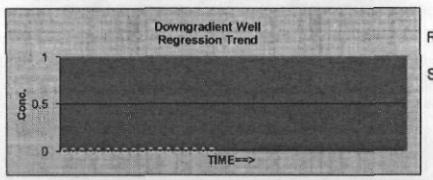
R-Sq. =
Slope =

Well 4



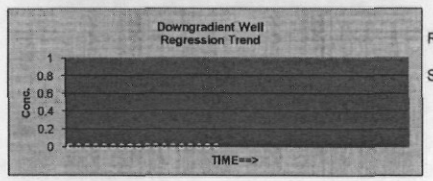
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for TOC

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	TOC	Units:	mg/L
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are NOT normally distributed, Use Non-Normal Test	NO		
Well 3	Data are normally distributed. Use T-Test.	NO		
Well 4	Data are NOT normally distributed. Use Non-Normal Test	NO		
Well 5	Data are NOT normally distributed. Use Non-Normal Test	NO		
Well 6	Data are NOT normally distributed. Use Non-Normal Test	NO		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2006Q2	1.4	2.1	1.1	<1	1.9	2.2
2	2006Q3	71	3.5	3.6	2.4	2.7	1.5
3	2006Q4	3.1	2.9	1.5	2.3	3	1.6
4	2007Q1	2.7	3.4	2.1	1.8	1.8	1.3
5	2007Q2	3.1	4.8	2.5	2.1	4.5	1.9
6	2007Q3	2.6	4.6	3	3.4	3.9	1.5
7	2007Q4	3.6	4.3	1	1.9	2.1	1.4
8	2008Q1	6.9	5.5	2.1	2.7	2.4	1.4
9	2008Q2	5.9	4.8	2.1	2.2	1.7	1.8
10	2008Q3	4.1	4.1	2.1	2.1	2.1	1.5
11	2008Q4	17.8	5.3	2.5	2.1	2.3	1.6
12	2009Q1	5.1	4.7	2.4	2.1	2.5	1.9
13	2009Q2	7.4	4.4	2.4	2	2.5	1.8
14	2009Q3	36.7	4.3	1.7	2.1	2.1	1.8
15	2009Q4	29.2	4.2	1.2	2.5	1.8	1.2
16	2010Q1	19.8	4.4	1.1	2.6	6.3	1.1
17	2010Q2	43	4.8	1	1.1	2.9	2.6
18	2010Q3	55.2	4.9	1.7	1.2	2.8	3.9
19	2010Q4	27.5	3.5	1.5	2.6	4.1	2.8
20							
21							
22							
23							
24							
25							
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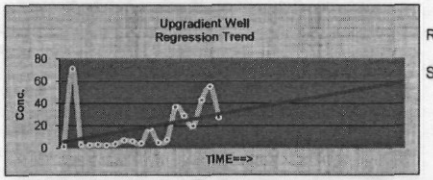
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
	St.Dev. ►	20.45	0.84	0.72	0.71	1.16	0.78
	Mean ►	18.22	4.24	1.93	2.18	2.81	1.81
	Is the Mean greater than 3X St.Dev. ? ►	NO	YES	NO	YES	NO	NO

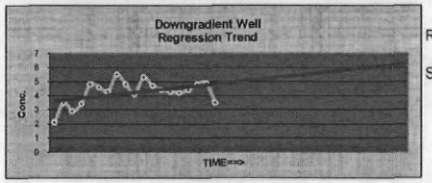
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



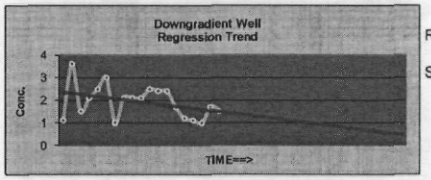
R-Sq. =
Slope =

Well 2



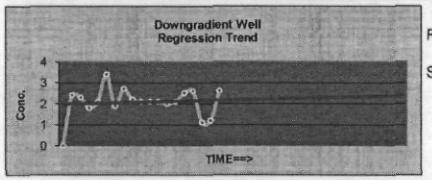
R-Sq. =
Slope =

Well 3



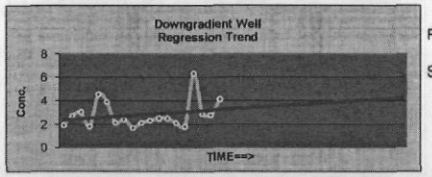
R-Sq. =
Slope =

Well 4



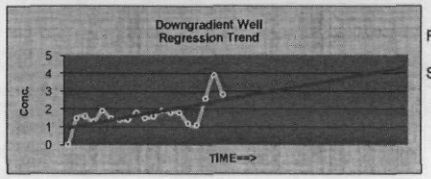
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Groundwater Data and Analysis Summary for Turbidity

Note: Begin by completing this section.

Facility Name:	Omega Proteins Inc		
Permit Number:	VA0003867	Date:	2/13/2011
Parameter:	Turbidity	Units:	un
Upgradient Well Designation		Well 1	
Downgradient Well Designation		Well 2	
Downgradient Well Designation		Well 3	
Downgradient Well Designation		Well 4	
Downgradient Well Designation		Well 5	
Downgradient Well Designation		Well 6	

	Kolmorogov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Significant difference from Upgradient Well?	Trend Analysis	
			R-Sq.	Slope
Well 2	Data are normally distributed. Use T-Test.	NO		
Well 3	Data are NOT normally distributed. Use Non-Normal Test	NO		
Well 4	Data are NOT normally distributed. Use Non-Normal Test	YES		
Well 5	Data are NOT normally distributed. Use Non-Normal Test	NO		
Well 6	Data are normally distributed. Use T-Test.	NO		

Place an "X" above the monitoring well to see Comparison Test results

	Groundwater Monitoring Report Date	Well 1 (Upgradient Well)	Well 2	Well 3	Well 4	Well 5	Well 6
1	2008Q2	51.7	14	0.01	NR	14	14.23
2	2008Q3	542	38.9	18.9	84	5	48.4
3	2008Q4	441	32.3	16.5	109	3.2	44.6
4	2009Q1	23.1	7.76	21.7	345	21.3	34.2
5	2009Q2	6.27	10.89	15.8	6.4	5.63	15.7
6	2009Q3	11.18	11.76	20	185	70	50
7	2009Q4	36.2	5.81	14.71	3.18	70.5	25.5
8	2010Q1	37.3	6.3	20.2	11.1	87	28
9	2010Q2	21.1	6.61	50.1	13.99	11.25	7.3
10	2010Q3	7.08	32.7	7.83	3.95	8.54	12.9
11	2010Q4	121	NR	169	717	179	3.06
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
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27							
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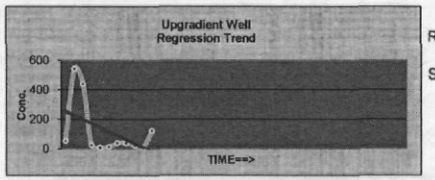
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
	St.Dev. ►	188.76	13.11	46.97	220.89	54.63	16.69
	Mean ►	117.99	16.70	32.25	147.86	43.22	25.81
	Is the Mean greater than 3X St.Dev. ? ►	NO	NO	NO	NO	NO	NO

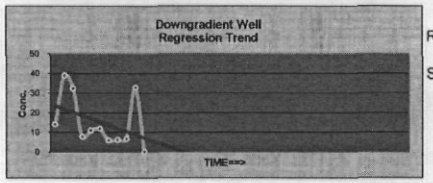
Note: The comparison of the Mean to three times the Standard Deviation may help to determine if there is a statistically significant change in the trend of a data set. If any of the cells above contain "NO", this may be an indication of a sudden increase or decrease in concentration of the parameter. This should only be used as a flag and not the basis for any final decisions regarding the acceptability of the data.

Well 1 (Upgradient Well)



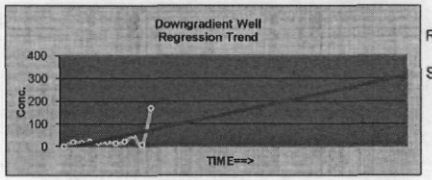
R-Sq. =
Slope =

Well 2



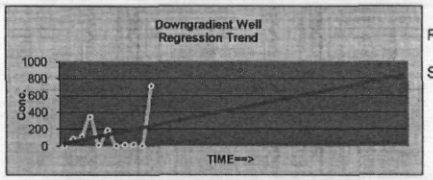
R-Sq. =
Slope =

Well 3



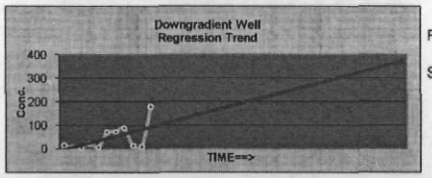
R-Sq. =
Slope =

Well 4



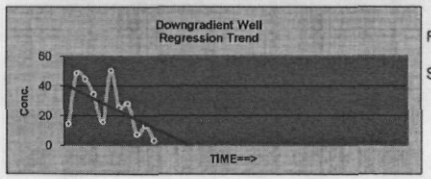
R-Sq. =
Slope =

Well 5



R-Sq. =
Slope =

Well 6



R-Sq. =
Slope =

Attachment 11 – NPDES Permit Rating Spreadsheet

NPDES PERMIT RATING WORK SHEET

☐ Regular Addition
☐ DiscretionaryAddition
☐ Score change, but no status change
☐ Deletion

NPDES NO. VA0038674

Facility Name: Omega Protein Inc. - Reedville

City/County: Northumberland County

Receiving Water: Cockrell's Creek

Reach Number: _____

Is this facility a steam electric power plant (SIC=4911) with one or more of the following characteristics?
1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

☐ YES; score is 600 (stop here) ☒ NO (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

☐ YES; score is 700 (stop here)
☒ NO (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary SIC Code: 2077 Other SIC Codes:
Industrial Subcategory Code: 000 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No Process Waste Streams	0	0	☐ 3.	3	15	☐ 7.	7	35
☒ 1.	1	5	☐ 4.	4	20	☐ 8.	8	40
☐ 2.	2	10	☐ 5.	5	25	☐ 9.	9	45
			☐ 6.	6	30	☐ 10.	10	50

Code Number Checked: 1

Total Points Factor 1: 5

FACTOR 2: Flow/Stream Flow Volume (*Complete either Section A or Section B; check only one)*

Section A ☐ Wastewater Flow Only Considered

Wastewater Type (See Instructions)		Code	Points
Type I: Flow < 5 MGD	☒	11	0
Flow 5 to 10 MGD	☐	12	10
Flow > 10 to 50 MGD	☐	13	20
Flow > 50 MGD	☐	14	30
Type II: Flow < 1 MGD	☐	21	10
Flow 1 to 5 MGD	☐	22	20
Flow > 5 to 10 MGD	☐	23	30
Flow > 10 MGD	☐	24	50
Type III: Flow < 1 MGD	☐	31	0
Flow 1 to 5 MGD	☐	32	10
Flow > 5 to 10 MGD	☐	33	20
Flow > 10 MGD	☐	34	30

** Outfall 002: 0.265 MGD 30 day max (7.7%)
Outfall 995: 3.188 MGD 30 day max (92.3%)
3.453 MGD total

Since more than 90% non-contact cooling water less than 1.0 MGD process water, it is Type I.

Section B ☐ Wastewater and Stream Flow Considered

Wastewater Type (See Instructions)	Percent of instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10 %	☐	41	0
	10 % to < 50 %	☐	42	10
	> 50 %	☐	43	20
Type II:	< 10 %	☐	51	0
	10 % to <50 %	☐	52	20
	> 50 %	☐	53	30

Code Checked from Section A or B: 11

Total Points Factor 2: 0

FACTOR 3: Conventional Pollutants
(only when limited by the permit)

A. Oxygen Demanding Pollutant: (check one) ☒ BOD ☐ COD ☐ Other: _____

Outfall 002 – 470 kg/d * 2.2 = 1034 lb/d

Permit Limits: (check one)		Code	Points
☐	< 100 lbs/day	1	0
☐	100 to 1000 lbs/day	2	5
☒	> 1000 to 3000 lbs/day	3	15
☐	> 3000 lbs/day	4	20

Code Checked: 3

Points Scored: 15

B. Total Suspended Solids (TSS)

Outfall 002 – 160 kg/d * 2.2 = 352 lb/d

Permit Limits: (check one)		Code	Points
☐	< 100 lbs/day	1	0
☒	100 to 1000 lbs/day	2	5
☐	> 1000 to 5000 lbs/day	3	15
☐	> 5000 lbs/day	4	20

Code Checked: 2

Points Scored: 5

C. Nitrogen Pollutant: (check one) ☒ Ammonia ☐ Other: _____

Nutrient GP allocates 21,213 lb/yr of TN to the facility @ 198 operating days/yr = 107 lb/day

Permit Limits: (check one)		Nitrogen Equivalent	Code	Points
☒	< 300 lbs/day		1	0
☐	300 to 1000 lbs/day		2	5
☐	> 1000 to 3000 lbs/day		3	15
☐	> 3000 lbs/day		4	20

Code Checked: 2

Points Scored: 0

Total Points Factor 3: 20

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply.

☐ YES (If yes, check toxicity potential number below)

☒ NO (If no, go to Factor 5)

Determine the *human health* toxicity potential from Appendix A. Use the same SIC code and subcategory reference as in Factor 1. (Be sure to use the human health toxicity group column ☐ check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No Process Waste Streams	0	0	☐ 3.	3	0	☐ 7.	7	15
☐ 1.	1	0	☐ 4.	4	0	☐ 8.	8	20
☐ 2.	2	0	☐ 5.	5	5	☐ 9.	9	25
			☐ 6.	6	10	☐ 10.	10	30

Code Number Checked: ____

Total Points Factor 4: N/A

FACTOR 5: Water Quality Factors

A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-based federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge:*

		Code	Points
☒	Yes	1	10
☐	No	2	0

B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

		Code	Points
☐	Yes	1	0
☒	No	2	5

C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

		Code	Points
☒	Yes	1	10
☐	No	2	0

Code Number Checked: A 1 B 2 C 1

Points Factor 5: A 10 + B 5 + C 10 = 25 TOTAL

FACTOR 6: Proximity to Near Coastal Waters

A. *Base Score: Enter flow code here (from Factor 2):* 11 *Enter the multiplication factor that corresponds to the flow code:* 0.0

Check appropriate facility HPRI Code (from PCS):

	HPRI#	*Code*	*HPRI Score*
☐	1	1	20
☐	2	2	0
☒	3	3	30
☐	4	4	0
☐	5	5	20

HPRI code checked: 3

Flow Code	*Multiplication Factor*
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

Base Score: (HPRI Score) 30 X (Multiplication Factor) 0.00 = 0 (TOTAL POINTS)

B. *Additional Points ☐ NEP Program*
For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

	Code	Points
☒ Yes	1	10
☐ No	2	0

C. *Additional Points ☐ Great Lakes Area of Concern*
For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 areas of concern (see Instructions)

	Code	Points
☐ Yes	1	10
☐ No	2	0

N/A

Code Number Checked: A 3 B 10 C N/A

Points Factor 6: A 0 + B 10 + C N/A = 10 TOTAL

NPDES NO: VA0003867

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	5
2	Flows/Streamflow Volume	0
3	Conventional Pollutants	20
4	Public Health Impacts	N/A
5	Water Quality Factors	25
6	Proximity to Near Coastal Waters	10
	TOTAL (Factors 1 through 6)	60

S1. Is the total score equal to or greater than 80? ☐ Yes (Facility is a major) ☒ No

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ No

☐ Yes (Add 500 points to the above score and provide reason below:

Reason:

NEW SCORE: 60

OLD SCORE: 160

Elimination of Outfall 001 (Contact Cooling Water) and Outfall 003 results in the revised total score, reclassifying the facility from a major to a minor.

Jaime Bauer
Permit Reviewer's Name

(804) 527-5015
Phone Number

February 10, 2011
Date

Attachment 12 – Cockrell Creek Ambient Water Quality Data

Cockrell Creek Ambient Water Quality Monitoring Analysis

Location: 20' from Outfall 001

Date/Parameter	Temp (°C)	pH (S.U.)	Ammonia (mg/L)	Salinity (ppt)	I	pKa^S	pKa^S_T	UIA	Acute	Acute Criterion (mg/L)	Chronic	Chronic Criterion (mg/L)
2006-05	29	8.25	0.784	16.8	0.340528751	9.29199	9.162392968	0.109013	2.137359	1.756909336	0.321063	0.263913
2006-06	25.1	8.24	0.1	18	0.365300401	9.29541	9.292171455	0.081457	2.860407	2.351254672	0.429675	0.353193
2006-07	27.1	8.2	0.37	13.7	0.276815761	9.2832	9.215160575	0.088065	2.645773	2.174825551	0.397434	0.326691
2006-08	27.3	8.2	1.06	16.4	0.332285036	9.29086	9.216335335	0.087848	2.652309	2.180197609	0.398415	0.327497
2006-09	21.9	8.24	0.6	14.6	0.29527157	9.28575	9.386187477	0.066658	3.495446	2.873257018	0.525067	0.431605
2006-10	24.9	7.84	1.38	14.1	0.285014161	9.28433	9.287571954	0.034451	6.763221	5.559367613	1.015934	0.835098
2006-11	15.3	7.51	0.34	14.2	0.287064806	9.28461	9.598894943	0.008083	28.82542	23.69449251	4.329998	3.559259
2006-12	9.7	8.38	0.164	13.7	0.276815761	9.2832	9.778920575	0.038378	6.071167	4.990499078	0.911978	0.749646
2007-01	9.7	8.38	0.43	11.7	0.235923821	9.27756	9.773277487	0.038861	5.995798	4.928546082	0.900656	0.74034
2007-02	8	8.36	0.36	11.5	0.231843775	9.27699	9.827794441	0.032935	7.074485	5.815226448	1.062691	0.873532
2007-05	20.8	8.14	0.541	10.2	0.205363873	9.27334	9.409420215	0.051031	4.565875	3.753149048	0.685861	0.563778
2007-06	25.4	8.39	0.873	11.2	0.225726817	9.27615	9.263190301	0.118095	1.972988	1.621796033	0.296372	0.243617
2007-07	27	8.22	0.41	12	0.242047003	9.2784	9.213602486	0.092134	2.528929	2.078779437	0.379882	0.312263
2007-08	30.2	7.96	0.37	13.9	0.280914125	9.28377	9.115286149	0.065366	3.564517	2.930033205	0.535443	0.440134
2007-09	28.8	8.05	0.377	14.7	0.297324307	9.28603	9.162910754	0.071586	3.254807	2.675451082	0.488919	0.401892
2007-10	24.4	7.85	0.38	15.9	0.321989865	9.28943	9.308874601	0.033596	6.935403	5.700901076	1.041799	0.856359
2007-11	17.4	8.06	0.5	14.8	0.299377463	9.28631	9.53255409	0.032588	7.149876	5.877198345	1.074016	0.882841
2007-12	9.6	8.42	0.1	15.1	0.305539447	9.28716	9.786124444	0.041264	5.646528	4.641445783	0.848191	0.697213
2008-06	28.3	8.35	0.26	12	0.242047003	9.2784	9.171482486	0.13107	1.77768	1.461252621	0.267033	0.219501
2008-07	30.2	8.15	0.1	12	0.242047003	9.2784	9.109922486	0.098829	2.357606	1.937952148	0.354147	0.291109
2008-09	26.9	7.63	0.51	17	0.344653137	9.29256	9.231002133	0.024448	9.530326	7.833927879	1.431594	1.17677
2008-10	21.6	8.14	0.48	16	0.324048058	9.28972	9.399878632	0.052105	4.471718	3.675752428	0.671717	0.552152
2008-11	14.6	8.1	0.46	19	0.385989978	9.29827	9.635226617	0.028333	8.223658	6.759846796	1.235313	1.015428
2008-12	9.1	8.18	1.26	19	0.385989978	9.29827	9.813426617	0.022729	10.25103	8.426350644	1.539855	1.265761
2009-05	24.3	8.47	0.19	14	0.282963934	9.28405	9.306729023	0.127123	1.832871	1.506619895	0.275324	0.226316
2009-06	27.5	7.79	0.59	14	0.282963934	9.28405	9.203049023	0.037195	6.264217	5.149186254	0.940977	0.773483
2009-07	26.8	8.13	0.64	14	0.282963934	9.28405	9.225729023	0.074261	3.137591	2.579099564	0.471312	0.387418
2009-08	32.8	7.79	1.02	15	0.303485033	9.28688	9.034160935	0.053922	4.321056	3.551908181	0.649086	0.533548
2009-09	26.3	7.28	0.26	16	0.324048058	9.28972	9.247598632	0.01066	21.85792	17.96721202	3.283379	2.698937
2009-10	23.7	7.73	0.12	19	0.385989978	9.29827	9.340386617	0.023938	9.733414	8.000866434	1.462101	1.201847
2009-11	16.5	8.38	0.1	18	0.365300401	9.29541	9.570811455	0.060543	3.848492	3.163460229	0.5781	0.475198
2009-12	11.2	7.84	0.1	16	0.324048058	9.28972	9.736838632	0.012522	18.60661	15.29463548	2.794985	2.297477
2010-05	19	7.94	0.2	13.4	0.270671346	9.28235	9.476752646	0.028236	8.251785	6.782967232	1.239539	1.018901
2010-06	27.9	8.41	0.2	14	0.282963934	9.28405	9.190089023	0.142312	1.637252	1.345820859	0.245939	0.202162
2010-07	29.5	8.02	0.2	15.4	0.311705205	9.28802	9.142215318	0.070176	3.320246	2.729242228	0.498749	0.409972
2010-08	28.6	8.1	0.2	16.6	0.336406051	9.29142	9.174784035	0.077645	3.000833	2.466685109	0.450769	0.370532
2010-09	27.6	8.34	0.3	18.6	0.377709061	9.29712	9.21288385	0.118169	1.971761	1.62078715	0.296187	0.243466
2010-10	24.1	7.83	0.4	18.4	0.373571147	9.29655	9.325712818	0.030948	7.52873	6.188615867	1.130925	0.92962
2010-11	13.4	7.87	0.2	17.6	0.357036425	9.29427	9.670111027	0.015598	14.93806	12.27908941	2.243915	1.844498
2010-12	4	8.14	0.2	28.9	0.593127943	9.32685	10.00725166	0.013393	17.39657	14.29997897	2.613218	2.148066

When acute or chronic criterion is highlighted, that means that the ambient WQS was potentially violated.

Cockrell Creek Ambient Water Quality Monitoring Analysis

Location: 20' from Outfall 002

Date/Parameter	Temp (°C)	pH (S.U.)	Ammonia (mg/L)	Salinity (ppt)	I	pKa^5	pKa^5_T	UIA	Acute	Acute Criterion (mg/L)	Chronic	Chronic Criterion (mg/L)
2006-05	25.5	8.16	0.536	16.8	0.340528751	9.29199	9.275792968	0.071147	3.274928	2.691990576	0.491942	0.404376
2006-06	24.8	8.02	0.1	17.8	0.361167567	9.29484	9.301321124	0.04972	4.68625	3.852097237	0.703943	0.578641
2006-07	26.2	8.23	0.36	13.9	0.280914125	9.28377	9.244886149	0.088116	2.644249	2.173572723	0.397205	0.326502
2006-08	26.2	8.23	0.45	17.5	0.354971488	9.29399	9.255106065	0.086243	2.701664	2.22076782	0.405829	0.333592
2006-09	21.8	7.84	1.52	15	0.303485033	9.28688	9.390560935	0.027377	8.510837	6.995907782	1.278452	1.050887
2006-10	24.9	8.18	0.14	14	0.282963934	9.28405	9.287289023	0.072452	3.215943	2.643505086	0.483082	0.397093
2006-11	15	7.63	0.1	13.9	0.280914125	9.28377	9.607766149	0.010416	22.37017	18.38827849	3.360326	2.762188
2006-12	11.1	8.22	0.303	13.9	0.280914125	9.28377	9.734126149	0.029702	7.844707	6.448349267	1.178389	0.968636
2007-01	11.1	8.22	0.73	12.2	0.246131202	9.27897	9.729326106	0.030022	7.761042	6.379576431	1.165822	0.958305
2007-02	8.2	8.2	0.35	11.5	0.231843775	9.27699	9.821314441	0.023357	9.975499	8.199860032	1.498465	1.231739
2007-05	20.8	8.14	0.541	10.2	0.205363873	9.27334	9.409420215	0.051031	4.565875	3.753149048	0.685861	0.563778
2007-06	25.7	8.31	0.684	11.6	0.233883591	9.27728	9.254595936	0.102017	2.283935	1.877394415	0.34308	0.282012
2007-07	25.2	8.32	0.34	11.9	0.240005527	9.27812	9.271640763	0.10054	2.317475	1.904964422	0.348119	0.286153
2007-08	30.2	8	0.29	13.4	0.270671346	9.28235	9.113872646	0.071439	3.261507	2.680958668	0.489926	0.402719
2007-09	28.6	8.14	0.155	14.7	0.297324307	9.28603	9.169390754	0.085469	2.72614	2.240887122	0.409506	0.336614
2007-10	23.9	7.81	0.21	15.9	0.321989865	9.28943	9.325074601	0.029639	7.861348	6.462028422	1.180889	0.970691
2007-11	17.8	8.29	0.45	14.6	0.29527157	9.28575	9.519027477	0.055728	4.181057	3.436828731	0.628056	0.516262
2007-12	6.8	8.54	0.13	15.1	0.305539447	9.28716	9.876844444	0.044016	5.293581	4.35132343	0.795173	0.653632
2008-06	28.5	8.44	0.14	11	0.221650917	9.27559	9.162187826	0.159373	1.461977	1.201745076	0.21961	0.18052
2008-07	30.5	8.23	0.21	12	0.242047003	9.2784	9.100202486	0.118813	1.961058	1.611989979	0.29458	0.242144
2008-09	25.5	7.97	0.74	17	0.344653137	9.29256	9.276362133	0.047065	4.950567	4.06936587	0.743647	0.611278
2008-10	21.4	8.14	0.84	16	0.324048058	9.28972	9.406358632	0.051373	4.535437	3.728129485	0.681289	0.560019
2008-11	15.1	8.17	0.53	19	0.385989978	9.29827	9.619026617	0.03434	6.78513	5.577377261	1.019226	0.837803
2008-12	8.4	8.22	0.31	19	0.385989978	9.29827	9.836106617	0.023632	9.85937	8.104401917	1.481021	1.217399
2009-05	24.3	8.58	3.42	14	0.282963934	9.28405	9.306729023	0.157977	1.474895	1.212363844	0.221551	0.182115
2009-06	27.8	7.66	0.63	13	0.262484634	9.28122	9.190502879	0.028634	8.137216	6.688791562	1.222329	1.004754
2009-07	25.5	8.31	0.28	14	0.282963934	9.28405	9.267849023	0.099255	2.347487	1.929634012	0.352627	0.289859
2009-08	33.9	7.77	0.19	15	0.303485033	9.28688	8.998520935	0.055789	4.176455	3.433045758	0.627364	0.515694
2009-09	26	7.34	0.2	16	0.324048058	9.28972	9.257318632	0.011953	19.49381	16.02391203	2.928255	2.407025
2009-10	23.5	7.88	0.1	18	0.365300401	9.29541	9.344011455	0.033214	7.01515	5.766453115	1.053778	0.866205
2009-11	17.6	8.85	0.1	18	0.365300401	9.29541	9.535171455	0.171126	1.361567	1.119208137	0.204527	0.168121
2009-12	10.5	8.19	0.1	16	0.324048058	9.28972	9.759518632	0.026238	8.880181	7.299508838	1.333933	1.096493
2010-05	18.6	7.67	0.3	13.3	0.268624043	9.28207	9.489430118	0.014929	15.60697	12.82892962	2.344395	1.927092
2010-06	27.8	8.44	0.2	14.1	0.285014161	9.28433	9.193611954	0.149917	1.554198	1.277550675	0.233463	0.191907
2010-07	29.3	8.1	0.2	15.4	0.311705205	9.28802	9.148695318	0.082058	2.839461	2.334036983	0.426528	0.350606
2010-08	27.2	8.19	0.2	16.9	0.342590733	9.29228	9.220997521	0.08518	2.735381	2.248483222	0.410894	0.337755
2010-09	26.9	8.06	0.2	18.3	0.371502825	9.29627	9.23470739	0.062687	3.716881	3.055276173	0.55833	0.458947
2010-10	24	7.88	0.2	18.3	0.371502825	9.29627	9.32866739	0.034367	6.779713	5.572924192	1.018412	0.837135
2010-11	13.4	7.73	0.6	17.2	0.348779211	9.29313	9.668971531	0.011378	20.47845	16.83328658	3.076162	2.528605
2010-12	4	8.15	0.2	29.7	0.61005192	9.32919	10.00958716	0.013629	17.09632	14.05317519	2.568117	2.110992

When acute or chronic criterion is highlighted, that means that the ambient WQS was potentially violated.

Cockrell Creek Ambient Water Quality Monitoring Analysis

Location: 20' from Outfall 995

Date/Parameter	Temp (°C)	pH (S.U.)	Ammonia (mg/L)	Salinity (ppt)	I	pKa^S	pKa^S_T	UIA	Acute	Acute Criterion (mg/L)	Chronic	Chronic Criterion (mg/L)
2006-05	24.5	8.1	0.472	16.7	0.33846719	9.29171	9.307908472	0.058342	3.993663	3.282790815	0.599906	0.493123
2006-06	25.1	8.24	0.125	18.4	0.373571147	9.29655	9.293312818	0.081261	2.867321	2.356938088	0.430713	0.354046
2006-07	27	8.14	0.21	14.4	0.291167351	9.28518	9.220381094	0.076727	3.036735	2.496196448	0.456162	0.374965
2006-08	30.1	8.14	1.34	16.6	0.336406051	9.29142	9.126184035	0.093573	2.490044	2.046815871	0.374041	0.307462
2006-09	24.6	8.41	0.254	14.7	0.297324307	9.28603	9.298990754	0.114358	2.037458	1.674790126	0.306056	0.251578
2006-10	24.6	7.98	1.01	14.1	0.285014161	9.28433	9.297291954	0.045949	5.0708	4.16819728	0.761708	0.626124
2006-11	15.2	7.58	0.313	14.1	0.285014161	9.28433	9.601851954	0.00942	24.73536	20.33246401	3.715612	3.054233
2006-12	10.7	8.39	0.338	13.8	0.278864734	9.28348	9.746803333	0.042122	5.531577	4.546956338	0.830924	0.683019
2007-01	10.7	8.39	0.823	11.6	0.233883591	9.27728	9.740595936	0.042702	5.456383	4.48514668	0.819628	0.673734
2007-02	8.4	8.25	0.29	11.4	0.229804374	9.27671	9.814553004	0.026532	8.781874	7.218700566	1.319166	1.084354
2007-05	20.8	8.12	0.229	10.4	0.209433153	9.2739	9.409981775	0.048786	4.775947	3.925828657	0.717417	0.589717
2007-06	25.2	8.23	0.878	11.3	0.227765388	9.27643	9.269951624	0.083587	2.78751	2.291332918	0.418725	0.344192
2007-07	26.2	8.14	0.907	11.9	0.240005527	9.27812	9.239240763	0.073707	3.161173	2.59848394	0.474854	0.39033
2007-08	30.2	7.98	0.521	13.9	0.280914125	9.28377	9.115286149	0.068237	3.414574	2.806780077	0.512919	0.421619
2007-09	28.9	7.92	0.476	14.7	0.297324307	9.28603	9.159670754	0.054452	4.279007	3.517344103	0.642769	0.528356
2007-10	24.8	7.73	0.382	16	0.324048058	9.28972	9.296198632	0.026434	8.814329	7.245378443	1.324041	1.088362
2007-11	17.5	8.11	0.55	14.6	0.29527157	9.28575	9.528747477	0.036728	6.343875	5.214665221	0.952943	0.783319
2007-12	7.2	8.49	0.82	15.4	0.311705205	9.28802	9.864735318	0.040487	5.754934	4.730556038	0.864475	0.710599
2008-06	28.5	8.22	0.56	12	0.242047003	9.2784	9.165002486	0.101931	2.285856	1.878973326	0.343369	0.282249
2008-07	30.8	6.65	0.41	12	0.242047003	9.2784	9.090482486	0.003614	64.47786	53.00080341	9.685516	7.961494
2008-09	26.9	7.63	1.26	16	0.324048058	9.28972	9.228158632	0.024605	9.469651	7.784053447	1.42248	1.169278
2008-10	21.6	8.12	0.51	16	0.324048058	9.28972	9.399878632	0.049877	4.671483	3.839958961	0.701725	0.576818
2008-11	14.9	8.12	0.59	19	0.385989978	9.29827	9.625506617	0.030279	7.695125	6.325393008	1.15592	0.950166
2008-12	8.8	8.66	5.82	19	0.385989978	9.29827	9.823146617	0.064269	3.625365	2.9800498	0.544583	0.447647
2009-05	25.1	8.36	0.18	14	0.282963934	9.28405	9.280809023	0.107145	2.174623	1.787540239	0.32666	0.268515
2009-06	29.3	7.77	0.58	14	0.282963934	9.28405	9.144729023	0.040488	5.754854	4.730490243	0.864463	0.710589
2009-07	25.6	8.2	0.6	14	0.282963934	9.28405	9.264609023	0.07934	2.93674	2.414000371	0.441141	0.362618
2009-08	32.7	7.84	0.62	15	0.303485033	9.28688	9.037400935	0.059686	3.903767	3.20889673	0.586403	0.482023
2009-09	27.4	7.28	1.05	16	0.324048058	9.28972	9.211958632	0.011561	20.15416	16.56671686	3.027448	2.488563
2009-10	23.7	7.75	0.14	18	0.365300401	9.29541	9.337531455	0.025199	9.246374	7.600519161	1.38894	1.141709
2009-11	16.1	8.29	0.1	18	0.365300401	9.29541	9.583771455	0.048383	4.815763	3.958556998	0.723398	0.594633
2009-12	11.2	8.25	0.1	16	0.324048058	9.28972	9.736838632	0.031567	7.381165	6.067317418	1.108759	0.9114
2010-05	18.6	7.75	0.6	13.5	0.272719067	9.28264	9.489995231	0.017872	13.03716	10.71654697	1.958372	1.609782
2010-06	28	8.77	0.3	14.2	0.287064806	9.28461	9.187414943	0.276651	0.842215	0.692301049	0.126513	0.103994
2010-07	30	8.45	0.2	15.4	0.311705205	9.28802	9.126015318	0.174138	1.338023	1.099854742	0.200991	0.165214
2010-08	30.1	7.94	0.2	16.7	0.33846719	9.29171	9.126468472	0.061114	3.812517	3.13388873	0.572696	0.470756
2010-09	27.9	8.23	0.2	18.5	0.375639892	9.29684	9.202878305	0.096204	2.421942	1.990836207	0.363811	0.299053
2010-10	24	7.77	0.2	18.3	0.371502825	9.29627	9.32866739	0.026884	8.6668	7.124109808	1.30188	1.070145
2010-11	13.4	8.01	0.2	17.6	0.357036425	9.29427	9.670111027	0.021404	10.88588	8.948191602	1.635218	1.344149
2010-12	4.1	8.14	0.2	29.2	0.599471148	9.32773	10.00488702	0.013466	17.30337	14.2233703	2.599219	2.136558

When acute or chronic criterion is highlighted, that means that the ambient WQS was potentially violated.

Attachment 13 – Summary of Comments Received During the Public Comment Period and Response

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296 804/527-5020

SUBJECT: Summary of Comments Received During Public Comment Period VPDES Permit No. VA0003867, Omega Protein, Inc., Northumberland County

TO: File

FROM: Jaime Bauer, Water Permit Writer

DATE: May 2, 2011

PURPOSE: To summarize and respond to comments received during the public comment period required for reissuance of the VPDES permit for Omega Protein, Inc. (VA0003867).

BACKGROUND:
On June 4, 2010, the DEQ Piedmont Regional Office received an application from Omega Protein, Inc. for reissuance of VPDES permit number VA0003867 for the Omega Protein, Inc. – Reedville fish processing facility located in Northumberland County. Subsequent revisions of the application were received on September 16, 2010 and January 11, 2011. A proposed draft permit for reissuance of the VPDES permit was prepared based on these applications and additional information required to reissue the permit.

Section 9 VAC 25-31-290 of the VPDES permit regulation requires that public notice allowing a comment period of at least 30 days be given when a draft permit has been prepared. Section 9 VAC 25-31-300 allows that any interested person may submit written comments on the draft permit and may request a public hearing and all comments shall be considered in making the final decision to issuing the permit. A response to significant comments received on the draft permit during the public comment period must be provided.

On March 30, 2011 and April 6, 2011, the Northumberland Echo published the public notice that draft permit for Omega Protein, Inc. – Reedville (VA0003867) was available for public review and comment. The comment period ended at 11:59 pm on April 29, 2011. During the 30 day public comment period, comments were received from the owner, Omega Protein, Inc., and Southern Environmental Law Center (SELC). These comments and the DEQ Piedmont Regional Office response to comments are summarized below. The DEQ Piedmont Regional Office did not receive any requests for a public hearing.

Omega Protein, Inc. submitted by Bill Purcell, Environmental Manager
Comments received on April 12, 2011 via email, revised April 14, 2011 via email

Comment 1: Part I Page 1 of 14 – Oil and Grease
"Oil and Grease will not cross the liquid – vapor barrier in the evaporator. Years of data showing results below detection support this fact and the analysis for O&G is expensive and uses a dangerous solvent (hexane) Omega understands that this parameter is from the effluent guidelines but that doesn't make it correct. We ask that O&G be removed as it not present in our evaporator condensate and the analysis

creates a hazardous waste. We believe that his would quality for the exemption to anti-backsliding for new information or mistakes, an exemption that has long been interpreted to apply to both technology – and water quality based effluent limitations. See, e.g., U.S. EPA NPEDES Permit Writers' Manual, EPA-833-B-96-003 (Sept. 2010), p.7-3." If O&G cannot be removed we ask that the monitoring frequency be reduced."

Staff Response: Staff believes that it is appropriate to maintain the Oil and Grease limitation in the permit in accordance with the Federal Effluent Guideline requirements of 40 CFR Part 408. Additionally, 9 VAC 25-31-220 L prohibits the reissuance of permits which contain effluent limitations which are less stringent than the effluent limitations in the previous permit except under certain conditions, none of which apply to this situation. Therefore, the Oil and Grease limitation will remain in the permit. However, Omega has demonstrated compliance with the limitation. Review of the DMR data indicates that the long term average loading of Oil and Grease is less than 5% of the permit limitation. Therefore, it is best professional judgment of staff that the monitoring frequency be reduced from twice per month to once per month in permit Part I.A.1.

Comment 2: Part I Page 1 of 14 – Fecal Coliform
"As we discussed at length Omega does not contribute fecal coliforms to the discharge from 002. The fecal coliforms measured on the outfall 002 are from a naturally occurring source (seagulls and other water fowl using the aerated ponds). Effluent entering the aerated ponds is sterile as it is condensed steam. We ask that after the special bacteriological study conducted by VIMS, DEQ, and Omega confirms that elevated bacteriological levels around Omega's docks is from naturally occurring sources that this parameter be removed from the permit. With regard to the special bacteriological study, we DEQ to amend the Schedule of Compliance in Part I.C. to specifically acknowledge the study – something like: "The permittee shall achieve compliance with the Fecal Coliform and Enterococci limitations in Part I.A.2, or alternatively, conduct a study to demonstrate that these limitations are not required Additionally the frequency should read 1 per week without the requirement to sample between 10am and 4pm. The sampling frequency is for municipal treatment works that have potential for diurnal flows. We are an industrial operation and our discharges do not fluctuate temporally."

Comment 3: Part I Page 1 of 14 – Enterococci
"Same comments as fecal coliforms above."

Staff Response: Limitations on fecal coliform and enterococci have been included in the draft permit in conformance with the VPDES Permit Regulation which prohibits the issuance of a VPDES permit that is not consistent with area-wide planning documents or regulations promulgated under the law, including Total Maximum Daily Load (TMDL) regulations. It is the understanding of DEQ Piedmont Regional Office VPDES staff that Omega will be working with VIMS and DEQ to conduct further studies on sources of bacteria impairment in Cockrell Creek and the unnamed tributary of Cockrell Creek. Mention of the collaboration on the study has been added to the fact sheet for the permit. The language proposed by Omega for the Schedule of Compliance condition in Part I.C is not appropriate in that it represents an ambiguous self-modifying condition that would bypass due process procedures of public notice, comment, or public hearings in conjunction with a mid-cycle relaxation of permit requirements. Should new information be presented after permit reissuance demonstrating good cause to justify a change to both the TMDL regulation and bacteria effluent limitations, procedures are available to amend the TMDL regulation and for the permittee to apply for a major VPDES permit modification. A major permit modification would be subject to public notice and comment. To avoid any potential backsliding

concerns, such a major permit modification would need to be completed no later than the end of the four-year compliance schedule outlined by Part I.C of the permit. A permit modification can only be approved if it is in full conformance with a corresponding amendment to the TMDL regulation.

DEQ staff agree that requirement that bacterial samples be collected "between 10am and 4pm" is not appropriate for this industrial discharge. Therefore, that requirement has been removed from permit Part I.A.1. as requested.

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Comment 4: Part I Page 2 of 14 – Copper, Total Recoverable
"Copper is not present in the discharge and has never been present. The discharge from outfall 995 is non-contact cooling water. Estuarine water is withdrawn from Cockrell Creek and pumped through carbon steel pipes through a titanium heat exchanger. Nothing is added to the cooling water expect heat. Cooper showed up in an earlier permit reissuance due to an interference/lab error. Omega nor the DEQ permit writer questioned the obvious erroneous result and it was included in the subsequent permit. Omega now uses a highly qualified VELAP certified laboratory (Universal Labs) that is very familiar with metals analysis in salt water. Five years of monitoring shows copper and silver levels below detection. It is not reasonable or logical to believe Omega is contributing either metal to its non-contact cooling water. We are asking that both copper and silver be removed from our permit. We believe that this would qualify for the exemption to anti-backsliding for new information or mistakes, an exemption that has long been interpreted to apply to both technology- and water quality-based effluent limitations. See, e.g., U.S. EPA NPDES Permit Writers' Manual, EPA-833-B-96-003 (Sept. 2010), p.7-3 If the parameter is not removed we ask to reduce the monitoring frequency and to change the sample type from 24-HC to Grab. The flow from outfall is either off or on with no fluctuation in flow."

Comment 5: Part I Page 2 of 14 – Silver, Total Recoverable
"Same comments as Copper above."

Staff Response: During the 2005 permit reissuance data was submitted and certified by Omega that indicated that a reasonable potential existed for the discharge of silver and copper at Outfall 995. Permit limitations that are protective of water quality were developed and since that time, the permit limitations have become effective. 9 VAC 25-31-220 L prohibits the reissuance of permits which contain effluent limitations which are less stringent than the effluent limitations in the previous permit except under certain conditions. Staff finds there to be insufficient new information, not available in 2005, to establish a defensible relationship between laboratory protocols to support the discrediting of data previously certified by Omega. Omega has demonstrated the ability to comply with the limitations and has consistently reported values for both copper and silver that are less than test method quantification levels. DEQ staff does not find good cause to exist to warrant less stringent limits for Total Recoverable Silver and Copper in permit Part I.A.2. at this time.

Omega has demonstrated compliance with the limitations for total recoverable copper and silver and review of the DMR data indicates that concentrations of both have been reported less than test method quantification levels consistently. Therefore, it is best professional judgment of staff that the monitoring frequency be reduced from once per month to once per quarter in permit Part I.A.2 for both copper and silver. Additionally, DEQ staff believes that changing the sample type from 24-HC to grab is also appropriate.
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Comment 6: Part I page 2 of 14 – Fecal Coliform
"The discharge from 995 is non-contact cooling water, if fecal coliforms are present in the intake then the will be present in the discharge. After confirmation of the previously mentioned special bacteriological study that the bacteriological impairment is from a natural source we ask that DEQ remove this parameter from the permit. With regard to the special bacteriological study, we ask DEQ to amend the Schedule of Compliance in Part I.C. to specifically acknowledge the study – something like: "The permittee shall achieve compliance with the Fecal Coliform and Enterococci limitations in Part I.A.2, or alternatively, conduct a study to demonstrate that this limitations are not required Additionally the frequency should read 1 per week without the requirement to sample between 10am and 4pm. The sampling frequency is for municipal treatment works that have the potential for diurnal flows. We are an industrial operation and our discharges do not fluctuate temporally."

Comment 7: Part I page 2 of 14 – Enterococci
"Same comments as fecal coliform above."

Staff Response: As previously stated limitations on fecal coliform and enterococci have been included in the draft permit in conformance with the VPDES Permit Regulation which prohibits the issuance of a VPDES permit that is not consistent with area-wide planning documents or regulations promulgated under the law, including Total Maximum Daily Load (TMDL) regulations. It is the understanding of DEQ Piedmont Regional Office VPDES staff that Omega will be working with VIMS and DEQ to conduct further studies on sources of bacteria impairment in Cockrell Creek and the unnamed tributary of Cockrell Creek. Mention of the collaboration on the study has been added to the fact sheet for the permit. The language proposed by Omega for the Schedule of Compliance condition in Part I.C is not appropriate in that it represents an ambiguous self-modifying condition that would bypass due process procedures of public notice, comment, or public hearings in conjunction with a mid-cycle relaxation of permit requirements. Should new information be presented after permit reissuance demonstrating good cause to justify a change to both the TMDL regulation and bacteria effluent limitations, procedures are available to amend the TMDL regulation and for the permittee to apply for a major VPDES permit modification. A major permit modification would be subject to public notice and comment. To avoid any potential backsliding concerns, such a major permit modification would need to be completed no later than the end of the four-year compliance schedule outlined by Part I.C of the permit. A permit modification can only be approved if it is in full conformance with a corresponding amendment to the TMDL regulation.

DEQ staff agree that requirement that bacterial samples be collected "between 10am and 4pm" is not appropriate for this industrial discharge. Therefore, that requirement has been removed from permit Part I.A.2 as requested.

Comment 8: Part I Page 4 of 14 part d – Total Phosphorus Reporting
"It is not reasonable nor scientifically defensible to take half of total phosphorus values that are equal to or less than QL for the method. All other values in the permit WL less than or equal to the QL are treated as zero. Omega asks DEQ to treat total phosphorus the same as every other parameter in the permit."

Staff Response: The total phosphorus reporting condition in Part I.B.1.d is consistent with the DEQ policy for nutrient reporting as required by the General VPDES Watershed Permit Regulation for Total Nitrogen

and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed. Therefore, no change to Part I.B.1.d of the permit is warranted.

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Comment 9: Part I Page 4 of 14 part 2 a – Discharge and Monitoring of Refrigeration Water
"Omega asks to remove 36°F from the definition of refrigeration water. Omega believes that someone could interpret this as a permit condition. 36°F is a goal that Omega tries to maintain but varies greatly depending on environmental factors and fish catch."

Staff Response: DEQ staff included the 36°F in the definition of refrigeration water based on information provided by Omega. Since 36°F is not a maximum temperature under which the fish are kept, but an operational goal temperature, DEQ staff agrees it is appropriate to update the definition of refrigeration water. "36°F" has been removed from the definition included in Part I.B.2.a of the permit.

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Comment 10: Part I Page 4 of 14 part 2 e – Discharge and Monitoring of Refrigeration Water
"The logistics and expense of sampling each vessel once a week is logistical nightmare and extraordinary expense that Omega cannot support. Refrigeration water will not vary appreciably between vessels as the refrigeration systems, Bay water, and fish are identical. Vessels do not come to the dock on a schedule typically only when they have a full load of fish so they arrive at any time day or night. The first two boats to the dock pump off their refrigeration water before coming to the dock while the rest of the fleet will not pump off until their turn to pump their fish to the plant for processing. This occurs around the clock and fishermen are not trained to collect samples. Trying to coordinate collection and delivery of samples to our commercial laboratory located 100 miles away would be very difficult. Omega proposes to collect 2 refrigeration water samples each month which corresponds with the current sampling effort of refrigeration water behind the vessels. We would rotate through the vessels during the season so that by the end of the permit term DEQ would have a complete characterization of refrigeration water. We do not understand the point of analyzing refrigeration water for salinity. Refrigeration water is estuarine water mixed with fish blood that is in turn discharged back into the designated portion of the Bay."

Staff Response: DEQ staff agrees that an adequate evaluation of refrigeration water discharges from the fishing vessels can be accomplished with fewer than once per week sampling from each vessel. Sampling of refrigeration water in Part I.B.2.e of the permit has been reduced to no less than two samples per month such that a sample is collected from each vessel at least twice per fishing season.

The concentration of salinity is required in order to determine compliance with water quality standards.

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Comment 11: Part I Page 4 of 14 part 2 f - Discharge and Monitoring of Refrigeration Water
"Since Omega is now characterizing refrigeration water directly we see no point in continuing the practice of sampling refrigeration water behind 2 vessels a month. DEQ has over 20 years of data showing that the water quality in the discharge plume is no different than background. It was also pointed out during our discussions that the exercise can be dangerous because the sampling is conducted from a small boat. Our 160 ft long fishing vessels can operate in sea conditions that a small sampling vessel would find unsafe."
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Staff Response: DEQ staff agrees that since Omega will now be required by the VPDES permit to monitor refrigeration water that ambient water quality monitoring of the Chesapeake Bay before and after discharges of refrigeration is unnecessary. Evaluation of the ambient water quality data submitted by Omega has been inconclusive as to whether or not the refrigeration water may be causing an impact on ambient water conditions. Monitoring of the refrigeration water prior to discharge will provide a better characterization of the water. Ambient water quality monitoring prior to and after discharge of refrigeration water from the vessels has been removed from permit Part I.B.2.f.

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Comment 12: Part 1 Page 4 of 14 part 2 g- Discharge and Monitoring of Refrigeration Water
"The refrigeration water is identical from vessel to vessel. It s made up of seawater, and blood that leaks out of the menhaden while they are in the fish hold. We add nothing else and there is no reasonable expectation that vessels equipped with the same refrigeration system handling the same fish and seawater would create refrigeration water that is appreciably different. Repeated analysis of metals, pesticides, organics etc serves no useful purpose and is a waste of resources. Omega proposes to sample one vessel for the Attachment A pollutants."

Staff Response: Omega has provided no empirical data to support their claim that the discharge of refrigeration water is substantially identical from vessel to vessel, given variations in vessel size, holding times, etc. DEQ believes a minimum sample size of three boats is warranted to establish confirmation (i.e. a 2nd sample) and verification (i.e., a 3rd sample) that refrigeration discharges are substantially identical, or not, from vessel to vessel. As proposed, the permit provides the flexibility for Omega to collect empirical data to establish such a relationship, and if the data supports their claim, to receive DEQ approval to limit their remaining sampling obligation. However, should the data not support a substantially identical relationship, then a sampling scan of each boat is appropriate. Part I.B.2.g. of the permit has been modified to further clarify the opportunity for designating substantially identical discharges of refrigeration water.

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Comment 13: Part I Page 7 of 14 part 6 – Licensed Operator Requirement
"Operator licensure testing and training is geared toward activated sludge/biological treatment. Omega uses exclusively physical/chemical treatment (ammonia stripping) to treat wastewater. Omega proposes removal of this requirement."

Staff Response: DEQ concurs that the licensed operator requirement is not appropriate for wastewater treatment using exclusively physical/chemical treatment and that the condition is directed toward biological treatment processes. Omega has requested authorization that the aerated pond be used in case of an emergency for storage purposes. Part I.B.6 of the permit has been modified so that a licensed operator is required if the aerated lagoon is used for process or co-mingled wastewaters.

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SELC submitted by Rick Parrish, Senior Attorney
Comments Received April 28, 2011 via email

Comment 1:
"Explicitly state that the discharge of untreated bailing water into the Chesapeake Bay and its tributaries is not permitted: Currently, the only mention of bail water in the draft permit is in Part I.B.2.a:
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'Refrigeration water does not include bail water...' This implies but does not clearly state that the discharge of bailing water is not permitted. The fact sheet mentions bail water on page 2 of 15 describing what it is, how it is currently dealt with (dumping in the Atlantic), and future plans to install a treatment plant. Nowhere does either document specify that bail water, as defined in the fact sheet, may not be discharged in the Bay. A statement should be added to the permit to effect that 'until the new treatment system is installed, the only currently authorized method of discharge of bail water is into the Atlantic Ocean in accordance with the MPRSA.'"

Staff Response: DEQ staff believes that the permit contains appropriate language to address what the permittee is and is not authorized to discharge. Specifically, the permittee is only authorized to discharge in accordance with information submitted with the permit application as incorporated on the permit cover page. The permittee has not submitted an application for the explicit discharge of bail water. Bail water may be treated and discharged as part of fish processing at the plant as long as the effluent is within the limitations of the VPDES permit. Additionally, Part I.A.1 and Part I.A.2 specify the type of discharge that may occur at each outfall. No further language is necessary in the permit to prohibit the discharge of bail water. The fact sheet (page 2) has been modified to include language that specifies that the discharge of bail water to State waters, other than via Outfall 002 and in accordance with permit Part I.A.1, is not authorized by this permit.

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Comment 2:

"Include a short statement on the history of Omega's treatment of bailing water: To emphasize the importance of proper treatment of nutrient-rich bail water in the future, we recommend adding a short statement referencing the history described above to the fact sheet."

Staff Response: DEQ staff believes that the information regarding bail water contained in the fact sheet is sufficient to describe the handling of it by the facility. Additionally, DEQ does not have evidence of a conclusively supporting that the permittee was discharging bail water into the Chesapeake Bay. Therefore, it would be inappropriate to include such accusations at this time.

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Comment 3:

Require recordkeeping of bailing water discharged until the new treatment system is in place (whether or not actually installed by the 2012 fishing season): The current draft permit requires Omega to maintain a refrigeration water discharge vessel log, which lists the date of every refrigeration discharge and the estimated volume of discharge. Given the prior unauthorized discharges of bailing water, the new permit should also require Omega to maintain a similar log with records of all of its bail water discharges whether in the Atlantic Ocean or elsewhere) that is available for DEQ inspection. While monitoring and sampling of the kind required for refrigeration water discharges directly into the Bay might not be necessary a logbook would not be burdensome and would enable DEQ to provide a minimum level of oversight over Omega's treatment of bail water until the new treatment system is installed.

Staff Response: DEQ staff agrees that recordkeeping of the disposal of bail water is appropriate. A special permit condition has been added to the draft permit as condition Part I.B.15 specifying recordkeeping requirements regarding bail water withdrawal and disposal tracking.

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Comment 4:
Clarify the visibility requirement for refrigeration water discharge: The fact sheet and draft permit include conflicting requirements on the permissible visibility of refrigeration water discharge. The fact sheet (page 2 of 15) requires that refrigeration water discharge into the Bay be made "at a rate such that the discharge is not visible." By contrast, Part I.B.2.c of the draft permit imposes a potentially more lenient requirement that discharge be made "at a rate that visibility of the discharge plume is minimized." The language in the draft permit should be changed to reflect the standard in the fact sheet.

Staff Response: Thank you for bringing the contradiction to the attention of DEQ staff. The fact sheet has been modified to specify that the plume created by the discharge of refrigeration water shall be minimal so that it is consistent with the Part I.B.2.c of the permit. Additionally, reference has been included that specifies the mixing zone for the refrigeration water discharge and the point at which the plume should no longer be visible.

Attachment 14 – TMDL Fact Sheets

Appendix A - List of Impaired (Category 5) Waters in 2010

Chesapeake Bay/Atlantic/Small Coastal Basins

Cause Group Code: **CB5MH-SAV-BAY** **Chesapeake Bay segment CB5MH**

Location: This cause encompasses the complete CBP segment CB5MH.

City / County: Chesapeake Bay - Co. Lancaster Co. Northumberland Co.

Use(s): Aquatic Life Shallow-Water Submerged Aquatic Vegetation

Cause(s) / VA Category: Aquatic Plants (Macrophytes) / 5A

The acres of submerged aquatic vegetation (SAV) mapped through aerial surveys does not meet the criteria in segment CB5MH. There is insufficient data to assess the water clarity criteria.

Chesapeake Bay segment CB5MH Aquatic Life		Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
	Aquatic Plants (Macrophytes) - Total Impaired Size by Water Type:	**211.761**		

Chesapeake Bay segment CB5MH Shallow-Water Submerged Aquatic Vegetation		Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
	Aquatic Plants (Macrophytes) - Total Impaired Size by Water Type:	**211.761**		

Sources:

Agriculture	Atmospheric Deposition - Nitrogen	Clean Sediments	ndustrial Point Source Discharge
Internal Nutrient Recycling	Loss of Riparian Habitat	Municipal Point Source Discharges	Sediment Resuspension (Clean Sediment)
Sources Outside State Jurisdiction or Borders	Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)		

Appendix A - List of Impaired (Category 5) Waters in 2010

Potomac and Shenandoah River Basins

Cause Group Code: CB5MH-SAV-BAY ***Chesapeake Bay segment CB5MH***

Location: This cause encompasses the complete CBP segment CB5MH.

City / County: Chesapeake Bay - Co. Lancaster Co. Northumberland Co.

Use(s): Aquatic Life Shallow-Water Submerged Aquatic Vegetation

Cause(s) / VA Category: Aquatic Plants (Macrophytes) / 5A

The acres of submerged aquatic vegetation (SAV) mapped through aerial surveys does not meet the criteria in segment CB5MH. There is insufficient data to assess the water clarity criteria.

Chesapeake Bay segment CB5MH Aquatic Life		Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
	Aquatic Plants (Macrophytes) - Total Impaired Size by Water Type:	**2.677**		

Chesapeake Bay segment CB5MH Shallow-Water Submerged Aquatic Vegetation		Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
	Aquatic Plants (Macrophytes) - Total Impaired Size by Water Type:	**2.677**		

Sources:

Agriculture	Atmospheric Deposition - Nitrogen	Clean Sediments	Industrial Point Source Discharge
Internal Nutrient Recycling	Loss of Riparian Habitat	Municipal Point Source Discharges	Sediment Resuspension (Clean Sediment)
Sources Outside State *Jurisdiction or Borders*	Wet Weather Discharges (*Point Source and* Combination of Stormwater, SSO or CSO)		

2010 Fact Sheets for 303(d) Waters

RIVER BASIN: Chesapeake Bay/Atlantic/Small Coastal Basins **HYDROLOGIC UNIT:** 02080102

STREAM NAME: **Chesapeake Bay and Tidal Tributaries**

TMDL ID: **C01E-17-PCB** **2010 IMPAIRED AREA ID:** CB-CB5MH

ASSESSMENT CATEGORY: 5A **TMDL DUE DATE:** 2018

IMPAIRED SIZE: 1,857.084 - Sq. Mi. **Watershed:** VAP-C01E

INITIAL LISTING: 2006

UPSTREAM LIMIT: VA-MD State Line

DOWNSTREAM LIMIT: Mouth

Chesapeake Bay mainstem and its small coastal tidal tributaries

CLEAN WATER ACT GOAL AND USE SUPPORT:

Fish Consumption Use - Not Supporting

IMPAIRMENT: PCBs

The Chesapeake Bay and its tidal tributaries are included under the 12/13/2004 VDH Fish Consumption Advisories for PCBs. No more than 2 meals/month are recommended of anadromous (coastal) striped bass.

Also, VDH issued an additional fish consumption advisory on 12/13/2004 for PCBs in the Mobjack Bay and its tributaries, particularly the East, West, and Ware Rivers. No more than two meals/month of gizzard shad are recommended.

The advisories are based on the results of DEQ's fish tissue monitoring program, which show elevated PCBs levels in several monitoring sites within the basin, including:

7-GWR007.97 in the Great Wicomico River
7-COC000.40 in Cockrell Creek
7-IND001.80 in Indian Creek
7-DYM000.00 in Dymer Creek
7-PNK019.85 in the Piankatank River
7-MLF002.45 in Milford Haven
7-WIN000.88 in Winter Harbor
7-EST002.65 in the East River
7-NOR003.65 in the North River
7-WAR005.77 in the Ware River

IMPAIRMENT SOURCE: Unknown

Source is considered unknown.

RECOMMENDATION: Problem Characterization

2010 Fact Sheets for 303(d) Waters

RIVER BASIN: Chesapeake Bay/Atlantic/Small Coastal Basins **HYDROLOGIC UNIT:** 02080102

STREAM NAME: **Cockrell Creek**

TMDL ID: **C01E-08-BAC** **2010 IMPAIRED AREA ID:** CB-CB5MH

ASSESSMENT CATEGORY: 4A **TMDL DUE DATE:** 2020

IMPAIRED SIZE: 0.464 - Sq. Mi. **Watershed:** VAP-C01E

INITIAL LISTING: 2008

UPSTREAM LIMIT: Upstream condemnation boundary

DOWNSTREAM LIMIT: Downstream condemnation boundary

Described in VDH Notice and Description of Shellfish Condemnation Number 012-002A, 9/22/2005.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Recreation Use - Not Supporting

IMPAIRMENT: Enterococci

Due to monitoring around the Omega Protein facility during development of the Cockrell Creek Shellfish TMDL, the segment was listed for the Recreation Use due to enterococci exceedances at several stations. The enterococci TMDL is due in 2020, however it was addressed during the Shellfish TMDL, which was approved by the EPA on 12/8/08 and by the SWCB on 4/28/09. The segment will be considered Category 4A.

IMPAIRMENT SOURCE: Nonpoint Sources, Industrial Facility

The report attributes the bacteria to nonpoint sources in the watershed and to discharges related to the Omega Protein facility.

RECOMMENDATION: Implementation

2010 Fact Sheets for 303(d) Waters

RIVER BASIN: Chesapeake Bay/Atlantic/Small Coastal Basins **HYDROLOGIC UNIT:** 02080102

STREAM NAME: **Cockrell Creek**

TMDL ID: **C01E-08-SF** **2010 IMPAIRED AREA ID:** CB-CB5MH

ASSESSMENT CATEGORY: 4A **TMDL DUE DATE:** 2010

IMPAIRED SIZE: 0.3065 - Sq. Mi. **Watershed:** VAP-C01E

INITIAL LISTING: 1998

UPSTREAM LIMIT:

DOWNSTREAM LIMIT: Downstream condemnation boundary

Portion of VDH Notice and Description of Shellfish Condemnation Number 012-002A, 9/22/2005 that is not administratively condemned.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Shellfishing Use - Not Supporting, Shellfishing Use - Not Applicable

IMPAIRMENT: VDH Shellfish Restriction

VDH-DSS Shellfish Condemnation Notice 012-002A, 9/22/2005

Cockrell Creek was listed as impaired of the Shellfish Consumption Use during the 1998 cycle due to VDH-DSS condemnation 2A, 9/14/1993. The area is currently addressed in condemnations 012-002A, 9/22/2005. The bacterial TMDL for Cockrell Creek was developed during the 2010 cycle and was approved by the EPA on 12/8/2008 and by the SWCB on 4/28/2009. However, it was subsequently determined that a portion of section A is considered an administrative closure by VDH; therefore the Shellfish Use is considered to be removed and the section will be partially delisted. The impaired portion will be classified as Category 4A.

IMPAIRMENT SOURCE: Nonpoint Sources, Industrial Facility

The report attributes the bacteria to nonpoint sources in the watershed and to discharges related to the Omega Protein facility.

RECOMMENDATION: Implementation/Partial delist